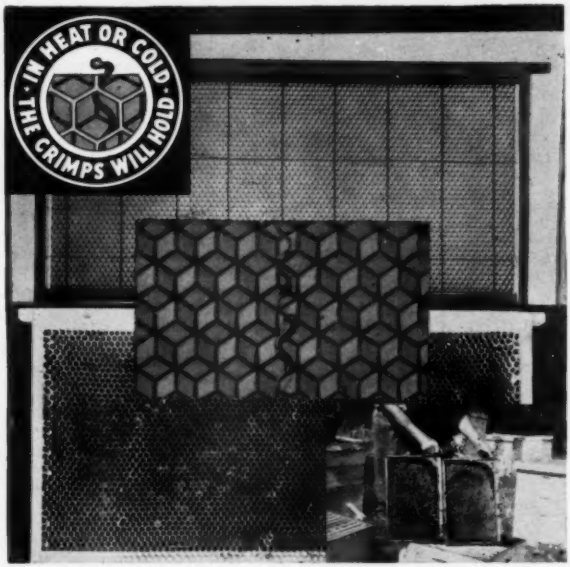
American BEE JOURNAL

VOL. 92, NO. 7 JULY, 1952

Part I

POLLINATION ROUND-UP

Dadant's Crimp-wired Foundation



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Food for Thought

There Is No Excuse for Price Cutting

In 1932, Dr. M. P. Rasmussen of Cornell University published a report on an extensive study of honey marketing in the United States. One of his five summary statements was that honey must be sold in two ways —on the basis of consumer demand or by price cutting. In the intervening years, this picture has not changed. Now that the Government this year is helping honey marketing with a marvelous promotional program for October, and the industry has embarked on an extended and continuous marketing program, there is no excuse for anyone to cut prices to sell honey.

Packers have blamed producers for cutting prices, and producers have blamed packers, in a "dog-eat-dog" situation which hasn't done anyone the least bit of good. And there is no excuse for anyone not knowing what current market prices are.

Each month each of the bee journals brings to you the latest market information. Moreover, you can obtain FREE the "Semi-Monthly Honey Report," issued by the Production and Marketing Administration, U. S. Department of Agriculture, Washington 25, D. C. This report gives you a summary of crop conditions; market prices of producers' sales of large lots of honey to bottlers in 60-pound cans, and producer-packer or packer sales of honey in all forms to the wholesaler, the retailer, and the consumer; and other pertinent market information. A post card requesting that your name be put on the mailing list is all it takes to be fully informed of current market prices and customary markups from the wholesale level to the retail and consumer levels.

Be a good business man and a good citizen of the honey industry by maintaining price levels and customary markups of the trade.

A Reserve Supply of Queens is a Good Beekeeping Practice

Never before in our experience, have queens been so difficult to obtain as they have been this spring. This was not the fault of queen rearers; it was entirely due to inclement weather. But it brings to mind forcefully that a reserve supply of queens not only is a good beekeeping practice but can often be good insurance against colony loss or failure.

Partly due to several years of relatively low prices for honey, beekeepers have become negligent of many good beekeeping practices. Now that price conditions have improved and crop prospects are excellent, it behooves us to awake from our lethargy and to return to good beekeeping methods. A reserve supply of queens, at least 1 queen for every 10 colonies, is a good beekeeping practice. Kept in nuclei or in a queen reservoir, the beekeeper has a queen available whenever there is need for one, thus preventing serious interruption of brood rearing or even colony loss.

Let's Promote Honey in 1952-53

Recent action by the producers and packers of honey in California is to be commended. Here is an instance of both the buyer and packer and the producer working for a common cause; more publicity for honey with the consumer and thus a real effort to dispose of the crop without outside help.

As the plan is laid out, the buyers are to collect, at the time they buy the honey of the producer, five cents on each 60-pound can of honey. In addition the packer puts in an additional five cents. This is to go into a fund, supervised by an advisory board composed of packers and producers, and is to be used for both research and promotion of the sale of honey. The first quarterly assessment is due July 1, 1952. In the meantime an advance fund of $2500.00 has been raised by the assessment of $50.00 on each packer, the same to be rebated when the first quarterly assessment is made.

Colorado and Idaho are two other states where successful efforts are being made along this same line. Beekeepers and packers of other states might well follow their lead.

1952 should be a banner year for honey production. But it should also be a banner one for strong sustained effort for honey publicity and sales. The American Honey Institute is increasing its honey publicity to the full extent of its funds; the American Beekeeping Federation, similarly, has honey disposal as its prime object; and this fall comes the nation-wide effort on honey promotion and publicity on the part of the Production and Marketing Administration at Washington. Already, tieups are being made with large chain stores, and food distributing organizations, and test campaigns are going into action.

Naturally into these should be tied the individual beekeeper even though he relies on the larger packer to handle his honey. That is one reason for the lackadaisical condition existing in the honey markets in the last ten years (up to 1951). It was easier to sell honey in bulk than to make any effort to keep the neighbor next door or in the next block honey conscious. Old customers of the five and ten pound type were put off and are hard to get back to honey use.

Here, now, in 1952, will be an opportunity to "get our teeth into" a nationwide program of honey promotion and do our part in putting honey where it should be, both for us and the consumer, on every table. Roadside stands, selling talks to grocers, placards, booklets, newspaper articles for our weekly press and word of mouth, all should help us individual beekeepers tie ourselves into this campaign. Naturally, it is understood that we are doing our part as contributors to the Federation and the Institute.

There will be plenty of suggestions made in the bee press and at meetings of ways to help foster the program. The individual beekeeper must not fail in this effort. He is the one who has the most at stake. As Theodore once so aptly expressed it, "Every individual owes a part of his time to the upbuilding of the industry in which he is engaged."

Start planning now!

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THE AMERICAN BEE JOURNAL

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Our Cover Picture

Ben Knutson, Alamosa, Colorado, gets in his expert hand again with this picture of a honey bee on columbine. This bee is just collecting its load of pollen. Pollen gathering and constancy are the basis of the value of the honey bee in the pollination of more than fifty of our farm crops, particularly fruits and legumes. This is the first part of a two-issue pollination round-up.

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A New Boost for Honey

We've all dreamed about national advertising for honey. Here it is and here's how you can help.—Ed.

The Program

Following on the heels of the new price support program came another announcement which gave a lift to the entire bee and honey industry. The Food Distribution Branch of PMA has approved an extensive promotional program for honey to move more of the 1952 crop through normal trade channels and less of it to the government under the support program. (See May ABJ, page 188). This program will enlist the cooperation and support of all those in the food distribution field and will reach its peak in October, at the very time the bulk of the crop is ready to move to market, and at the time of National Honey Week.

This is a great opportunity for our industry. If it receives the support of beekeepers everywhere it can mean that honey will become firmly established as an important food item on the American table.

The PMA program came as the result of a direct request by the American Beekeeping Federation. The program is being directed by G. Chester Freeman, in charge of the Food Trades Division of the Food Distribution Branch, PMA. Some 40 to 50 Government employees are now working on honey promotion in Washington and in the regional and state offices of PMA and will continue to work until the program is completed. National food groups such as the Grocery Manufacturers of America, the National Ice Cream Manufacturers' Association, and many others have been contacted by Mr. Freeman and his associates. The regional and state PMA personnel will also contact state associations of wholesale and retail grocers, chambers of commerce, P. T. A. associations, hotel and restaurant organizations and all other groups engaged in marketing or preparing foods. Honey producers can help make these contacts.

Progress So Far

Mr. Oscar Beyer, area field supervisor of the Production and Marketing Administration's Chicago office, visited our office this month to explain the work they are now doing. The program is being carried out through five regional offices in New York, Chicago, San Francisco, Atlanta, and Dallas. The Chicago office is the Midwest Division of eleven states—from Ohio west to Minnesota and south to Missouri.

The American Honey Institute is cooperating fully with the program and promotional material has been furnished PMA officials who are now using it in testing store displays with Kroger and Jewell Tea Company. Beyer, Freeman and others of PMA have personally contacted nearly every large food group in the country and almost without exception have been promised cooperation. Kroger, one of the largest chains, is at present setting up experimental honey displays to see which will work best in October. Jewell Tea is also doing this, using three kinds of displays placed in three different places in the stores, and at three price levels. Other groups whom these officials have contacted personally and who have promised cooperation include: National Association of Wholesale Grocers, National Association of Retail Grocers, American Meat Institute, National Tea Co., Red and White, I. G. A., National Dairy Company, National Association of Retail Bakers, Bakers Helper Magazine, Independent Biscuit Company, Wheat Flour Institute, American Institute of Baking, Owens Illinois, Independent Grocers' Alliance, National Restaurant Association, Sunshine Biscuit Company, Super Market Institute, and many others.

Honey will be used on several T-V programs. At the convention of the National Restaurant Association at Navy Pier in Chicago in May, a large display of honey was used. These steps are just the beginning of the national program. The net result may bring us, as a similar program brought to the apple industry, more than a million dollars worth of publicity.

American Beekeeping Federation Plans

To coincide with the PMA program, the Federation has undertaken a three-fold plan: 1. To bring all resources within the bee and honey industry into a common effort to promote consumer demand for honey. 2. To create at the time of special events, e.g. October and National Honey Week, a distribution and sales program within the honey industry. 3. To continue a promotional program after Government promotional aid has ceased.

The Federation has suggested the following program for state and county beekeepers' associations: To call a meeting of officers to decide how best they can help, and to appoint an active Marketing Committee, if they do not have one. To use state bulletins to advise beekeepers of the program and what they can do. To encourage ladies' auxiliaries to promote honey actively. To call attention to the promotional material available from the American Honey Institute, to advise members on how to contact grocers, drug stores, bakers, restaurants, hospitals, schools and others about the use of honey. Association members can also enlist the help of newspapers, radio and T-V stations, public utilities and civic clubs in publicizing honey. Many of these groups will welcome a new idea to carry out.

Ladies Help

Along with the Federation effort, the National Ladies Auxiliary, under the leadership of Mrs. Carl L. Soder, President, is working out their own program for furthering this promotion. Wives of beekeepers and those who keep bees of their own, will contact clubs, newspapers, radio and T-V, fairs, schools and other groups to publicize honey from now until the end of October.

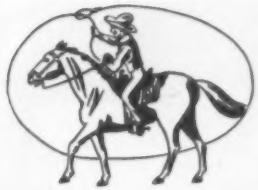
What You Can Do

Each of us in the industry can help this important program. Special emphasis on local advertising along with this national advertising program should boost sales as never before. We can help by making sure that we have a quality product to sell. We can help by contacting locally all the organizations mentioned earlier in this article. If our honey is sold in local stores or at our own stands, we can make sure that it is given a good display and well advertised in newspapers, on the radio, and with promotional material.

Give this program some thought and pass along your ideas for helping to other beekeepers. National promotion is something we have never had before but we have all seen what it can do for other products. If we all help in every way possible it will be a big step on the high road to successful honey marketing.

Pollination Round-up

Part I



48 Years of Apple Production

by Senator Harry Flood Byrd *

FOR 48 years I have been engaged in the production of apples. My associates and I operate practically 4,000 acres. Bees are an absolute necessity in apple production. Each year we rent at least one stand of bees per acre. These bees are brought in just before the blooming period and are taken out a week or ten days later, before we start to spray.

From careful observance, we have found that we cannot overestimate the importance of pollination in order to obtain production. You no doubt know that some varieties of apples are self-fertile. That is to say, they are fertilized by their own bloom. Others require cross-pollination, and certain varieties do not pollinate other varieties. In the commercial field the two outstanding self-fertilizing varieties are the Rome Beauties and the Northwest Greenings. The Delicious, Winesaps and Stayman Winesaps all require cross-pollination, the Delicious especially. The Stayman Winesaps and Black Twigs do not pollinate other varieties.

I have found, by long experience, that the closer the trees are to each other for cross-pollination, the better. In my last planting of 55,000 trees I alternated the varieties in each row for the purpose of giving the bees an opportunity to cross-pollinate from one variety to another. It is unquestionably true that where the varieties are interplanted, we obtain larger crops by reason of the more effective cross-pollination. Care should be taken to plant in proximity those varieties that bloom at approximately the same time, so that the pollination will be more effective.

We have known for years when the bees have worked for only one or two days in the pollinating period, on account of adverse weather conditions. It is amazing what bees can do in a short period of time if weather conditions are right. This is determined mainly by the temperature and by the wind. I have known trees to be pollinated on one side, where there was less wind, and not pollinated on the other side exposed to the wind.

The sum total of this experience is that bees are an absolute necessity for successful apple growing, and this applies also to many other fruits and vegetables. I cannot overestimate the importance of the bee industry for the benefit of mankind.

I extend to you, and through you to the other producers of bees, my best wishes and my hope for a prosperity which will enable this essential industry to perform its functions.

* Honorable Harry F. Byrd, Committee on Finance, United States Senate.

Education for Pollination

by Lyman E. Coe

Samuel Roberts Noble Foundation

A friend recently remarked that the beekeeper had done a remarkable job of selling pollination. We, as individual beekeepers, have not kept pace with the publicity that we have sponsored through our Federation.

The old adage that a salesman is born, not made, might be turned around to read that a pollinating beekeeper is made, not born. The fact that the beekeeper, as we know him, is having a hard time adjusting himself to keeping bees for seed production might be one major factor slowing up the pollination program.

In the livestock industry, all breeds have a standard of perfection, and every breeder dreams of the day when he will produce an individual that can qualify as that mythical standard. Perhaps the beekeepers need a standard for a pollination expert. The old definition of an expert, "a man away from home," will not fit this man as he truly must be an expert in many fields.

This expert should realize that the seed produced is dependent on the parent seed stock, the climatic conditions, the condition of the soil, the cultural methods, insect control, and the harvesting equipment. When all of these are optimum, then the bees, properly managed for pollination, will substantially increase the seed yield. In order to understand and realize the maximum yield of seed production, this pollinating expert should have a working knowledge of the following subjects.

A knowledge of botany has always been a requisite for the honey producer. The pollinating beekeepers are finding nectar and pollen-bearing plants that were of little interest to the honey producer, but these plants are in serious competition with the seed producer. This is brought about by the overcrowding of the seed fields. Learning these new plants and methods of controlling them, or in some cases not taking seed deals when they cannot be controlled, will solve many problems. This is a time when a good knowledge of botany will be very helpful.

An extensive knowledge of agronomy will be necessary for our expert. He should know cultural methods, how to identify varieties, and most important, how to identify noxious weeds. Some beekeepers have already had the experience of producing a seed crop only to find the percentage of noxious weed seed is above tolerance and to find it could not be sold at regular prices. This expert should be able to identify soil types, to interpret a soil analysis report, and to make recommendations and know the results to be expected when fertilizer is applied.

The honey producer has long been the victim and oftentimes the enemy of insecticides. The pollinator has already learned that proper insect control is necessary for seed production. He must be able to advise and to prepare proper control measures for insects and disease enemies and at the same time protect the bees and other pollinating insects as much as possible. He should be able to identify the insects and diseases harmful to the crops which he is using for pollination. Oklahoma and Kansas alfalfa seed producers and beekeepers both have had serious losses due to an unprecedented attack of the corn-ear worm (**Heliothis armigera**) on the green seed pods. This expert must be able to take frequent samples and to anticipate these attacks.

This expert should know enough research methods to sample fields to be sure the honey bee population is kept at a high level. He should be able to identify other pollinating insects and know their nesting habits in order to protect them from sprays, fires, etc.

The methods of harvesting small seeds have definitely been improved, since beekeepers have become interested in seed crops. One or two beekeepers are at the present interested in revolutionary methods of harvesting.

Training in agricultural engineering will definitely be of help to this new man of ours to utilize the existing methods and to make improvements.

The pollinating beekeeper is definitely a migratory beekeeper, and he will need to be mechanically minded enough to see that the trucks are in top shape and be inventive in order to improve on present beds, loading arrangements, etc.

Last but not least, this new type of beekeeper must be a super salesman, a top-notch man in public relations.

This beekeeper will disprove the old adage of beekeeping being an old man's work. He will have to stay in top physical condition to stand the heavy lifting and the long hours.

How and where this man will be educated and trained are the next questions. Courses in pollination need to be established in more colleges. Short courses may help solve this problem. The problem of train-

ing will depend largely upon the individual beekeeper. This transition has already started. In the past year, the writer has heard frequent references to the Journal of Economic Entomology made by beekeepers.

Interest in cultural and harvesting methods was manifest at the Ardmore Conference, and the machinery panel, a part of the conference, was the highlight of the program.

The seed growers are as much interested in our industry as we are in theirs, and the agricultural workers in all the services are watching with keen interest this transition from honey production to seed production.

Let us hope that when we get these new beekeepers trained with the qualifications that are necessary, pollination work will be remunerative enough to keep them interested in pollination.

Ardmore, Oklahoma

Potential Legume Seed Yields vs. Yields in the Bag*

by W. E. Dunham

Department of Entomology
Ohio Agricultural Experiment Station
Wooster, Ohio

THE widespread alarm over declining legume seed yields resulted from the fact that the supply was falling far short of the demand with attendant high prices. This situation focused attention as never before on the necessity of working out a solution whereby adequate seed supplies could be obtained at prices which farmers could afford to pay. In fact the situation constituted a grave threat to the principles on which American agriculture is founded. In our agricultural system the liberal use of legumes is vital in our conservation and livestock programs as well as in the production of grain, oil and fiber for animal and human needs.

The establishment of the two Federal Legume Seed Research Laboratories in 1946 gave encouragement and momentum to the possible solution of legume seed problems. It also resulted in an increased tempo of activity in states already involved in legume seed research and stimulated studies in other states. At this time, the actual average yield per acre for many legumes was hardly one bushel as compared to the potential seed yielding capacity of 40, 12, 15 and 30 bushels per acre for alfalfa, red, mammoth red, and alsike clovers respectively. This intensified research program certainly offered a most fruitful future where marked improvement could be made rather rapidly.

Associated with this widespread interest in seed production has been the current heightened activity among growers to produce more seed, especially certified improved varieties. In many respects the tempo of this movement has been ahead of research findings and as a result trial and error has been a costly operation. Many growers do not appreciate what research really represents and that it takes time to work out thorough and reliable methods applicable for field conditions. Outstanding progress has been attained in alfalfa seed production in the West. Dr. Knowlton reports that in 1951, where a strict program was followed by farmers in two counties in Utah, the yield was approximately 10 bushels per acre. Yields of 20 to 30 bushels per acre have been reported in California. Going eastward into the humid region the yields from alfalfa, red, mammoth red, and alsike clovers have been encouraging in numerous cases. There also have been many disappointments. Research workers are most cognizant of the many complex factors associated with successful seed production. Seed growers, beekeepers and other allied groups are now realizing more fully the possible grave pitfalls they may encounter and consequently their dependence on research findings.

Potential vs. Actual Yields

One of the present outstanding difficulties in this new era of seed production is the known amount of seed on the plants as compared with the actual yields in the bag. Much authentic information explaining the discrepancy of yields has already been gathered. Of first importance to the seed grower is a rather accurate "rule of thumb" method for determining the potential yield based on actual seed on the plants. Otherwise he has no index as to the efficiency of his harvesting technique. By knowing the average number of good plump seeds per head and the average number of blossom heads per unit area, a fairly accurate index of seed yields can be made. Computing tables for red, mammoth red, and alsike clovers have been worked out by the Ohio Agricultural Experiment Station†

* Journal Article No. 27—'52.

† These tables can be obtained on request to The Ohio Agricultural Experiment Station, Wooster, Ohio.

Like other related phases of seed production, efficient harvesting methods play an important role in the success of the whole seed growing program. Improper timing of combining operations or cutting stands of legumes can explain much seed loss from shattering. Legumes should be cut early in the morning when there has been a heavy dew and never during the day when the clovers are dry. The present plant vigor level of clovers in general, will, if provided with bee coverage, produce the bulk of seed during the first 10 days of the blooming period. After this, the number of seeds per head usually drops off very rapidly. The different methods of windrowing should be evaluated carefully with attention focused on the method which most effectively reduces seed loss. Uniform windrows, threshed as soon as the legume is properly dried, help in reducing further losses. Beating rains and prolonged inclement weather which defers threshing operations contribute to poor yields. Combining and stationary threshing machines play their part in reducing seed yields. Reports show that 25 to 80 per cent of the seed may be lost during this operation. Efficient harvesting is highly important in the chain of complex factors governing successful seed production. The over-all success of the venture is no stronger than the "weakest link in the chain."

The Research Program

The past five years of intensive research programs conducted by state and federal agencies has been far-reaching. Those who initiated and are carrying through this thorough program are adding untold strength to the "backbone" of American agriculture.

There are still many problems in seed production which, when worked out fully, should add "seeds in the bag." The lack of plant vigor is definitely a bottleneck in seed production. The development of disease resistant varieties having the capacity for heavy seed production and meeting the standards for forage management will require long-time investigations. Knowledge on the influence of cultural practices, soil types, tilth, fertility levels and the addition of chemical elements is very essential. From the standpoint of legume pollination coverage it is especially important to develop plants which are attractive to pollinating insects and which will yield attractive pollen and nectar in quantities that will stimulate maximum activity by bees. Dr. Schuel, now in the Department of Apiculture, Guelph Agricultural College, Ontario, found in his red clover research in the Department of Botany, Ohio State University, that some clover plants produced sweeter nectar than others and that these same plants yielded the largest amounts of nectar.

Control of injurious insects and plant diseases is essential in promoting plant vigor. The entomologists have done a good job of devising methods and types of insecticides to control insects on legume plants. However, there is much research to be completed from the standpoint of the conservation of our beneficial insects. More pathological research on legume plant diseases is most essential and badly needed.

Concentration of hives of bees at different rates per acre for the different legumes without too much regard to colony condition has been the chief method employed for pollination coverage. In humid regions this method has not been entirely satisfactory because of the competition of too many similar legume fields without bees as well as other blooming plants in the same area. For example a farmer may rent bees for pollination and find his neighbors are harvesting almost as much seed as he. In reality he is financing the pollination of his neighbors' crops. Supplying bees on a community basis seems like a logical approach towards the solution of this problem. More intricate research on a long-time basis pertaining to colony management within the hive should raise the daily colony requirements of nectar and pollen as well as encourage greater storage of these products within the hive. A goal which may not be entirely attainable for research on legumes having distinct corolla tubes is the accumulation of information on bee behavior that will result in pollination at the stage when blossoms are most attractive for bee visitations. Ultimate research resulting in the most efficient pollinating colony unit is not an easy task.

Beekeepers and seed growers should keep in constant contact with research agencies for their latest findings as well as offering cooperation in field operations for their mutual benefit.

From this awakening of agriculture to the indispensable role of the honey bee in the welfare of mankind, there has come a broader and more diversified aspect to bee culture which gives wider scope and stability to the industry. Already thousands of colonies are being utilized for pollination services and a far greater number will be used in the future. This pollination service is so fundamental and the need so great that the largest portion of our beekeeping personnel may as time goes on be involved in this specialized phase of agriculture.

With full insect pollination coverage as represented in this cage test, it is possible to check the seed yielding potential for any clover field.

Alsike clover in Ohio. Under favorable conditions such fields should yield 10 bushels or more seed per acre.

Bee Concentration-- Poor Beekeeping But Good Business

by Harry J. Whitcombe

A vast new field of economic endeavor confronts the beekeeping industry. It is a challenge to modern beekeepers to change from a luxury product to an essential agricultural service basic to practically all American agriculture. The high and varied production of American agriculture and consequently the American appetite, is built upon the minute but powerful legume seed. A lack of legume seed has destroyed civilizations in the past. Until concentrated bee pollination came into the picture, together with good cultural practices, adequate insect control, and good harvesting practices, the United States was getting into serious shape as far as available legume seeds were concerned.

Concentration of bees for pollination purposes now covers many field crops and these crops vary so much in their needs not only from state to state, but from locality to locality within states, that books would only begin to cover the subject. In this short article, it will be necessary to limit discussion to only some phases of alfalfa seed production. The basic theories are applicable not only to the legumes but to many fruit and nut crops.

Large concentrations of bees in alfalfa seed fields have been occurring accidentally for years in different areas. It was only after the work by Jones and Vansell that there seemed correlation between availability of bees and larger seed crops. Actual concentration of bees in an alfalfa field with payment to the beekeeper was first tried in southern California but without trained observers was inconclusive. Growers in northern California had long been receptive to bees being placed in their fields for honey production, hoping to secure adequate pollination by this means. Following the southern California experience, a carefully prepared and controlled field experiment was run in northern California which produced spectacular results. Known seed production was almost trebled. In this case the limiting factor was not the pollination but the inability of the plants under the cultural practices used to produce more seed. The following year the work of agronomists to crowd the plants in a race with the apiculturists to furnish adequate pollination for these plants, resulted in an actual crop of seed being set of approximately 1800 pounds to the acre. The theoretical maximum is approximately 3,000 pounds.

Five years after this original trial, we find a great change in California beekeeping. Thousands of colonies of bees (about 50,000 in one operation alone) are moved hundreds of miles for the express purpose of pollinating alfalfa. Beekeepers are cooperating so as to be able to place thousands of hives in a field in a very short time. An industry, grown stagnant in the poor years following the war, is suddenly coming to life. The outside conversations at bee meetings are not all of honey or marketing, but of contracts — seed contracts — how much they received last year and what it is going to be this year. Beekeepers' phones are ringing with farmers calling and wanting bees on their places, not asking them to move them off. Beekeepers and research men, apiculturists and agronomists alike, are scratching their heads and wondering where do we go from here. In five years we have outrun all basic research to date done on bees regarding pollination. Everything from now on is a trial and error deal.

The guess work so far has been good but there are too many things we do not know. For instance, why does something work in one area that does not work in another? Why does one thing occur in a field that does not follow in a field a mile away? Can a better bee be developed for pollination than the ones we now have? Why does one type of colony do a better pollinating job than another? Is it better to supply the pollination over a long period of time or to let the blossoms accumulate for ten or twelve days and give two or three days of intensive pollination and then remove the bees for another ten or twelve days? Why do bees gather almost 100% of alfalfa pollen in one place and less than 1% in another? All of these are questions that we should be able to answer today, but in any event will have to be answered if we are to put the business on a sounder basis. At the present time we are producing results but we are doing it by a bull-in-a-china-shop method—by brute force rather than by finesse.

Concentrated pollination is a whole new concept of beekeeping. Deliberate saturation of an area means so many bees that no surplus honey is expected but rather that feeding may have to be done to provide winter stores. It requires the moving of hundreds of colonies of

bees weekly so that they can never learn the territory beyond the field needing pollination. It is the jamming of bees in an area not for cans of honey but for bushels of seed. It provides a good living for beekeepers, not through the largess of government price support but through their own initiative and enterprise. In California, it is the changing of an agriculture from no certified seed six years ago to an estimated 25 million pounds of certified alfalfa seed shipped to eastern markets in 1952. The beekeepers are the recognized deserving and earning partners in agricultural production, no longer the undesired tenants consigned to wastelands.

The future for American beekeepers has never had more promise. A great number of problems must be solved and the bumps may be hard and many, but now can be dimly seen the future for which the bee was created. It remains only for the beekeepers to be big enough and strong enough to reach that goal. The well being and prosperity of the United States depends on the well being and prosperity of American agriculture. American agriculture depends on legume seed production, and legume seed needs the services of the bee for maximum production. A greater challenge has never been laid at the doorstep of any industry.

California

Conditions and Rules for Pollinators

by Glenn Gibson

PRIOR to 1950 the potential value of pollination to the beekeeper and farmer received little attention. The service of bees was considered a free service and most beekeepers paid to locate bees on the farm. Now, many farm leaders recognize the value of bees.

Oklahoma is one of the major legume seed producers of the Southwest. Honey production, however, runs well below neighboring states, and this is likely the reason for so few large commercial beekeepers in Oklahoma. U.S.D.A. figures say we have about 56,000 colonies of bees, most of them in the hands of smaller beekeepers.

Honey production and prices in 1948 and 1949 were not favorable and I could see that I could not continue to operate at a loss. When I heard the discussion at Biloxi about pollination, we began figuring and then we began planning a pollination program.

We found that we would need research to fit our area and a request for work at our A. & M. College was a natural beginning. The college is now conducting experiments on all phases of legume seed production and this experimental work at the beginning of our pollination program has been priceless.

In our contract arrangements, we made our deals after investigating every source of information available, including a study of insects, insecticides, varieties, harvesting methods and colony management. I felt like an expert and proceeded to make contracts.

The skeptical farmer forced us to make a contract that would guarantee his normal yield and we did contract on that basis. During the seeding time in 1950, we had excessive rainfall and did not successfully harvest a single field, but we learned much of value.

We learned that a guaranteed normal yield is chin music. Who can say what is normal? This type of contract was further guarantee that the farmer would produce this **normal yield.** I would rather play checkers in a pool hall than make this type of contract again. It has received wide publicity and is a difficult barrier to overcome.

Both 1950 and 1951 taught us much about insecticides and we feel this is one of the difficult problems. Insecticides are necessary and have been good salesmen for the spray applicators. We have learned to time our moves to reduce bee losses to a minimum. Contracting farmers have been quick to follow our recommendations.

But why do we have to apply more insecticides as the years pass? Will we have to use parathion where toxaphene or DDT formerly would suffice? Is there any relation between a worm infestation and an earlier application of parathion, or other insecticides powerful enough to control injurious insects of wheat and allied crops? Does the same apply to weed control with 2-4D or the clearing of a wooded section? These and many other questions I have repeatedly asked entomologists and they convinced me that, until we have a program that will include all the factors necessary to sustain natural balance, our problems will be increasingly difficult.

You may ask, am I pollinating in 1952? Certainly. My income last year with extreme hardships compared favorably with honey production. However, experts do not yet exist in our outfit. How much less will I know in 1953?

You may ask, will I abandon hon-

How to Use Bees in a Commercial Orchard

by Paul C. Stark, Jr.

Stark Bros. Nurseries and Orchards Co.

THE best insurance the fruit grower can have for a good crop of fruit is a heavy population of bees in the orchard during the blooming season. The present trends toward fewer varieties with the concentration of production in only two or three varieties of each fruit, most of which are self-infertile, makes the bee carriers of pollen a must in most commercial orchards. Even the partially self-setting varieties of fruits respond favorably with more fruits, better formed fruits, and better balanced crops when adequate provisions are made for cross-pollination.

Bees do a magnificent job of fruit cross-pollination when sufficient colonies are properly located in the orchard. In a half day of the right pollinating weather, bee activity can set a crop of fruit, and some growers have preferred to move the bees from the orchard after a day or two of favorable weather. We prefer to leave them in through most of the blossoming period and take a chance with an overset of fruit. You can always take some off in the thinning operations, but once the blossoms are gone there is no way to get more apples on the trees until next season.

Chemical thinning with hormones, when done carefully in a well-planned spray program, has helped greatly to do away with the problem of too much pollination. Well-timed sprays of the right amount of material can give excellent fruit spacing, especially on apples to give good commercial sizing by the harvest period.

I have seen bees save a crop of apples following severe frosts when most of the blossoms were killed by spring freezing temperatures during the heavy blooming period. With good bee activity in cross-pollinating the remaining bloom, a profitable crop was harvested. The same situation comes up in a year of light bloom. Plenty of bees and heavy pollination of every blossom has produced many a crop of fine apples from a bloom that promised less.

We have always found it profitable to place at least one colony of bees for each acre of bearing orchard with three to five colonies at each location. Our blocks of trees are set in units of four rows to a variety, with our Starking Delicious in the middle to be pollinated from one side by Golden Delicious and the other by Jonareds. The colony groups are placed in the Starking Delicious rows. This means that no tree is more than two trees away from a source of cross-pollination and this works well in most of the apple growing areas. The same spacing of trees and bees satisfactorily sets crops of most of the other fruits we grow, however, we are careful to watch for cross-infertility and poor pollen producing varieties in order to provide a strong compatible pollen source no more than two rows away from the tree to be pollinated. Extra care should be exercised by the grower in lining up his variety location to provide a positive pollen source. Our state experiment station and nursery can best supply the latest information in lining out the tree planting program.

In our commercial orchards where new and improved varieties are given the large scale tests, we rent bees in the volume as outlined for large scale fruit production. In the experimental orchards, where we test thousands of new and promising varieties, we have our own colonies which are permanently established in the areas adjacent to the orchard. We have had very favorable experience in renting bees and find the beemen a fine group to cooperate with. We appreciate the great service they render in the production of quality fruit. In many areas where native bees are not plentiful the maintaining of profitable production is dependent on having plenty of good strong colonies in the orchards during the flowering season every spring.

Louisiana, Missouri

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ey production? We plan to go either way as circumstances warrant. However, we feel you should figure on grossing $2.00 in pollination in comparison with $1.00 in honey production.

To sum up, consider these things:

1. Never guarantee a normal yield unless the farmer wants to guarantee the weather and insect control (which can't be done).

2. Check into possible insect infestations. Learn about insecticides.

3. On any contract figure your income to begin with the first pound of seed.

4. Insist on proper spraying and harvesting.

5. Acquaint yourself with the economics of the legume seed in which you are interested.

6. Collaborate with all local beekeepers and officials and do not cut your service charge.

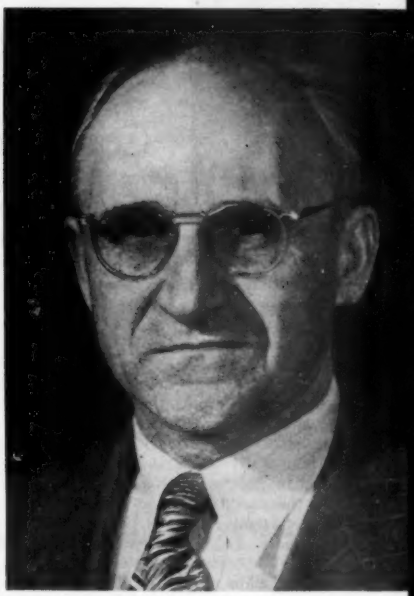
7. Consider pooling your efforts with two or three other beekeepers and hire a contact man to handle contracts, sweeping fields for insects and to make harvest arrangements.

8. If you do not plan to pollinate, do not belittle the beekeeper who is pollinating.

If you follow these suggestions, the chances are good that you will make some money. Ignore them, and watch the wolf suddenly appear at your door some morning.

Oklahoma

Honey Bees and Legume Seed Production in Indiana



by Ray T. Everly

Department of Entomology,
Purdue University

STUDIES in Indiana on the use of the honey bee in legume seed production have been aimed primarily at two objectives. First, to bring together seed growers and beekeepers interested in pollination and acquaint them with the facts of pollination, and second to obtain information under field conditions of the value of the honey bee as a pollinating agent, and the best practices to use.

At the present time in Indiana the use of the honey bee has been almost entirely restricted to red clover seed production. Preliminary work of an experimental nature indicates that the honey bee can produce substantial increases in yields of alfalfa seed. However, at the present there is about thirty times the acreage grown for red clover seed as for alfalfa. This ratio has varied from as low as 13:1 in 1941 to as high as 145:1 in 1948.

In 1949, Indiana beekeepers became interested in the use of the honey bee for red clover pollination. An investigation into the statistics of red clover pollination by honey bees indicated that the pollen collecting field bees from one strong colony can, under optimum conditions, produce three bushels of seed per acre. However, many factors operate to prevent a perfect relationship between the bees and clover flowers. Poor agronomic practices, crop susceptibility to diseases and insect attack, and competing sources of pollen and nectar are among those which tend to lower the effectiveness of the bees, while the activity of nectar collecting bees will help augment the amount of seed produced.

Although the maximum benefit of the honey bee as a pollinator of red clover will rarely be realized, there is reason to believe that honey bees do contribute materially to the production of red clover and other legume seeds in Indiana.

Through the offfce of the Chief Inspector of Apiaries, Mr. Gilbert Perigo, who has given invaluable help in our studies in Indiana, seed growers who desire bees for pollination of red clover are supplied with names of beekeepers in their vicinity who can furnish the necessary numbers of bees. Through radio, news articles, experiment station publications, and presentation of the pollination problem at farmers' and beekeepers' meetings, the practical as well as the experimental angles of pollination are presented and discussed. In this way we are attempting to get information to the growers and beekeepers.

The results of our observations of honey bees placed in clover fields are still of a preliminary nature due to the few numbers of fields which can be studied each season. There are sufficient indications, however, that in 90 per cent of the cases the presence of colonies of bees in the fields will increase seed yields from two to three times that of the state average. Mammoth clover appears more attractive to honey bees than medium red and generally yields more seed per acre. However, as the average numbers of seed per head is similar for both kinds of clover, the greater seed yields of Mammoth are associated with the greater number of flowers produced by this variety.

At the present time in Indiana the use of honey bees to pollinate legume crops is still in the experimental stage, and beekeepers are proceeding cautiously in adopting a pollination program of beekeeping. If extensive use of honey bees for this purpose develops, a limiting factor will be the contribution of the services of those beekeepers who maintain a small number of colonies or who lack adequate facilities for moving large numbers of bees. This is a problem that will need serious consideration in Indiana, where approximately 90 per cent of the beekeepers have less than 50 colonies of bees, as well as in other states where there is a large proportion of such beekeepers. It has been suggested by some investigators that the community approach to a planned pollination program is the

Ladino Clover Seed Production in the Pacific Northwest

by Herman A. Scullen, Apiculturist
Oregon Agricultural Experiment Station

LADINO clover as a seed crop has rapidly come to the front in a limited number of sections of Oregon and the northern Sacramento Valley of California. In Oregon close to 25,000 acres will be grown for seed this year. California will have in the neighborhood of 34,000 acres. The country as a whole will have around 70,000 acres.

Jefferson County, with 20,000 acres, is the largest producing area in Oregon. Josephine County is sec-

(Please turn to next page)

way to increase legume seed yields. Such a program could aid greatly in solving one of the hazards responsible for reduced bee activity, in that it will give a better means of controlling competing pollen and nectar sources. Since it is generally acknowledged that beekeeping is a highly specialized business requiring skill and knowledge as well as a liking for bees, these small beekeepers would fit into a community program if the seed growers could supply the bees and the beekeepers the management and care on a per colony fee basis and/or part of the honey.

The Indiana State Beekeepers Association has appointed a pollination committee composed of three beekeepers, a seed grower, and a research entomologist. This committee recommends the following pollination practices and precautions:

1. Two colonies per acre should be used.

2. Colonies should be placed in the field for the best results, as seed productions decrease as the distance from the clover field to the apiary site increases.

3. Colonies of bees should be scattered in equal groups throughout the field with a minimum of four groups or a maximum of ten colonies per group.

4. Successful pollination of large fields is more likely to be satisfactory than small fields.

5. The presence of areas or fields of flowering sweet clover, ladino or alsike, and in some years alfalfa may seriously interfere with the pollination of red clover. These fields, where possible, should be cut to throw them into bloom at a later time.

6. A contract stating specific responsibilities and method of payment should be made between the seed grower and beekeeper before bees are placed in the field.

Obtaining a maximum benefit from the use of honey bees as pollinators in red clover seed production, presupposes that all conditions affecting the crop prior to pollination have been solved and that there is a good stand of healthy, vigorous and attractive plants. This involves many conditions including such major factors as soil conditions, varieties, cultural practices (during seeding year as well as the crop year), and disease and insect control. Only when we have solutions for all these problems and the seed grower is aware of and practices them, can we begin to think of a maximum return from planned pollination. In fact, in our present studies these pre-pollination conditions may seriously limit bee activity and seed production, and for this reason, our current pollination recommendations are of a generalized nature and are not intended as a guarantee of a seed crop.

There are many factors affecting seed production which need further study. Among the more important ones which can be improved are the following:

1. Solve crop management problems so that beekeepers can be assured of a good stand of healthy, vigorous, bee-attractive plants for pollination.

2. Harvest seed efficiently.

3. Utilize the services of beekeepers with few colonies by promoting community cooperative pollination programs through local agricultural agencies.

4. Develop honey bees specialized for pollination, as well as better and more attractive crop plants through the practical use of genetics and breeding.

It should be stressed that a beekeeper who is contemplating converting in whole or part to a pollination service, should carefully investigate and study all the problems involved in this highly specialized field to determine for himself its value and probable returns as compared to honey production. Only by thoroughly convincing himself, and having a complete knowledge of pollination problems and difficulties, can he go out and successfully sell pollination to seed growers.

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ond with about 2000 acres. Close to 20,000 colonies of bees were moved into Jefferson County last year to pollinate a $5,000,000 seed crop which in addition to the Ladino included considerable red clover and some alsike. In Josephine County, the fields are small and frequently are located in or near considerable forest land so that few colonies of bees are moved into the county for pollination purposes. Bees from local small apiaries and bees in trees do the pollinizing.

Experiences of beekeepers and seed growers, coupled with our research work, have brought into the open several very important problems bearing on the use of bees for pollination of Ladino clover in Oregon.

Foremost among the facts to consider is that Ladino clover produces relatively little nectar and a beekeeper cannot expect to produce any surplus honey in most cases. This fact makes it necessary for the beekeeper to depend on rentals to pay for the cost of moving and a legitimate profit from the operation. Furthermore, the bees must be located for a part of the year in a district where they will store sufficient honey to carry them not only through the winter but the pollination period as well unless they are located within range of plenty of alfalfa or alsike. This usually is not the case.

A second very acute problem is disease. With so many colonies of bees being moved into an area in a short time and coming from many different districts, the disease problem naturally becomes serious. The State Department of Agriculture, which is shouldered with the responsibility of disease inspection, has had difficulty getting sufficient funds and qualified inspectors to cover the colonies being moved in. Furthermore the same department has the responsibility of certifying colonies as to strength where certification is requested.

The insecticide problem has not been too serious for the reason that seed growers themselves have a heavy investment in bee rentals and in general appreciate the need of bees for pollination. Apparently the few losses which do occur are the result of late morning applications. The insecticide most commonly used is 5% DDT used for lygus bugs.

A fourth problem which has recently come into the picture is OPS and its controls over rentals. In 1950 the rentals averaged around $5.00 per colony. In 1951 it was found necessary to increase these to $7.00 to secure an adequate number of bees for the rapidly increasing acreage of clover. Now the Office of Price Stabilization comes in and tells the seed growers and beekeepers that prices must be rolled back to the former level. The Portland office of OPS is making an effort to iron out this trouble. If these prices are forced back, it will mean an inadequate number of bees will be moved into Jefferson County to pollinate the clover crop. Even with a $7.00 rental some beekeepers are not interested in moving to Jefferson County. One of the urgent needs is some cost studies covering the rental of bees for pollination purposes. It was at least interesting to see seed growers pleading with OPS for the privilege of paying $7.00 per colony.

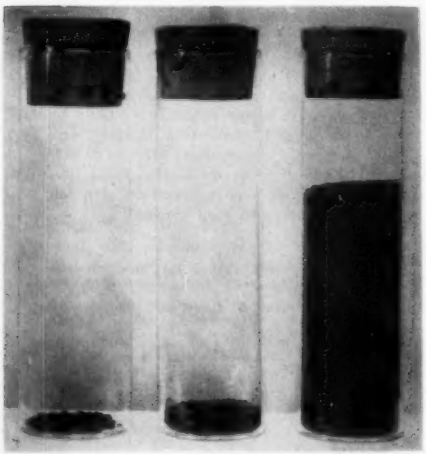
In Josephine County, bumble bees were found to be of some value in the pollination of Ladino but this was not so in most fields in Jefferson County. No other wild bees are of any appreciable help. Even the red clover in Jefferson County is pollinated largely by honey bees working it for pollen.

Our research work has also shown that wind can be of little help in pollinating Ladino. The results of one season's checks on the value of wind are shown in the illustration. Although some addititonal seeds were produced with wind the over-all effect of wind is probably a decrease in pollination as wind tends to keep the bees in the hives. These results were secured by caging a plot of Ladino to keep the bees out and submitting the caged plot to strong artificial wind during the blooming period.

Our studies have shown that the average Ladino field in Jefferson County produces 91,990 seeds per square yard whereas the potential production based on the actual number of heads produced and four seeds per floret is 277,592 seeds. In other words the average production is only about one-third of the possible production if every floret produced four seeds. It is quite probable that the plants would not be able to mature that many seeds if they were all pollinated. It is also true that such factors as irrigation, fertilizers and injurious insects and plant diseases enter in. However we do feel that a higher bee population would mean more seed. At present the bee population will average about 1.3 bees per square yard of clover or about one colony per acre. Some individual fields in Josephine County run as high as 3.5 bees per square yard.

It is the writer's opinion that the ratio of bees to heads of clover is more important as a measuring stick than colonies per acre. This opinion is supported by the fact that there is a wide variation in the number of clover heads per square yard even in the same district. In Jefferson County the fields have been found to vary from 62 to 181 open heads on a square yard.

The high altitude with its resulting short days in Jefferson County also limits the length of the working day for bees. Weather records indicate temperatures do not permit bees to work over an average of 8 hours per day and often when the temperature is high enough for bees to work, the wind will prevent normal bee activity. Under such working conditions it is reasonable to think more bees per acre are needed than under more favorable working conditions.



Ladino clover seeds produced in 100 heads:

Left: 271 seeds, in cage without bees or wind.

Center: 1627 seeds, in cage without bees but with strong wind.

Right: 21325 seeds, open field with bees and normal wind.

Alfalfa Pollination Problems in Utah

by Dr. George F. Knowlton*

LAST year Utah ranked third in production of this important crop, producing about 11,000,000 pounds of marketable alfalfa seed. However, here in the "Beehive State," we still have a number of seed growers who are reluctant to admit that bees are useful or necessary to successful alfalfa seed production. From this, don't get the idea that such opinion is the rule in our area; it isn't.

In the "Delta tract" of Millard County, Utah, we have a large and concentrated alfalfa seed industry. California and Utah beekeepers each year truck in from 10,000 to 15,000 colonies of bees to harvest the honey crop. This affords only one colony of bees for each two to three acres of alfalfa left for seed. Fortunately, a fairly high percentage of the honey bees actively cross-pollinate alfalfa blossoms in this area when conditions are favorable. This has been shown by the research of F. V. Lieberman, I. A. Hare, F. E. Todd, G. H. Vansell, Dr. G. E. Bohart and W. P. Nye, U.S.D.A. entomologists, most of whom have worked through the Legume Seed Research Laboratory, located at the Utah Agricultural Experiment Station, at Logan.

Pollination of the alfalfa flower is of vital importance to the yield of alfalfa seed.

In Utah, the value of honey bees as cross-pollinators of alfalfa varies greatly from one area to another. In Cache Valley of northern Utah, pollen-collecting honey bees are not numerous, rarely exceeding 1 per cent of the bees active in the field. In this area, more flowers are "accidentally" tripped by nectar carriers than are deliberately tripped by pollen collectors. In the Delta tract, from 10 to 20 per cent of the bees have been found to be pollen collectors, and counts at times have exceeded 30 per cent.

In Washington County seed fields, 12 to 30 per cent of the bees were observed to be pollen collectors.

Obviously, with so much difference in amount of cross-pollination per colony, a uniform rental for bees seems difficult to work out.

In my opinion, the seed grower-beekeeper contract should be a mutual benefit agreement. Nothing has injured our efforts to get these two interests together so much as someone, a beekeeper or a seed grower, driving too sharp a bargain, which was not shown to be sound when the settlement was due in the fall. One farmer, after hearing a pep talk on the value of bees in producing heavy seed yields, offered to give a beekeeper one-half the seed produced on his field if the beekeeper would place one colony of bees per acre on his farm. Seed growers, through setting too high a "floor" on their contract, for pounds of seed which must be obtained before beekeepers receive any benefit except perhaps a moderate hauling charge, also have made agreement between seed growers and beekeepers more difficult.

In Utah, no uniform "contract" rate now exists. Probably rentals should vary, depending on the average rate at which the field bees act as cross-pollinators. Also, the average seed yield obtained in the area will enter into the picture. Beekeepers are at present, over most of Utah, bringing bees in up to one hive per acre without charge, or have moved them in for only a hauling charge. Gradually, rentals are being agreed upon where more bees per acre are desired. Some of these are cash rentals, others provide a certain percentage of the proceeds to come from the sale of the seed crop. In some cases a contract has consisted of a hauling charge, plus a 5 to 10 per cent share in the seed raised beyond the four or five years' average just past, for fields where no extra pollinators had previously been provided. In Kane County, only about 120 colonies of bees were present in January of 1950. Today there are enough bees to provide a reasonable amount of pollination service for all alfalfa seed growers from Orderville, Utah, south to Fredonia, Arizona. Since the additional bees have been brought in, the average seed production in Kane County has been definitely increased.

A special extension service agent, D. M. Allred, was placed in the Delta tract during the seasons of 1948-1950, and N. T. Packer served in 1951. In the Uinta Basin, L. L. Hall served in a similar capacity during 1950-51. These agents worked for better seed grower-beekeeper relationships, proper timing of sprays and dust applications, and made a

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general effort to help seed growers improve insect pest control practices, while at the same time avoiding unnecessary bee poisoning losses. During the first two years in each area, the special agents accomplished much good. However, a large amount of parathion spraying and dusting occurred during alfalfa bloom, in late July and August of both 1950 and 1951 in the Delta tract. Neither the special agent nor the College and U. S. D. A. entomologists were able to convince many seed growers that this program, so detrimental to honey bee and native wild bee pollinators, should not be followed. The result has been serious loss of field bees and enactment by the Utah State Legislature of an "Economic Poisons Law." This law, if enforced, may help to correct the situation. However, I prefer to see such situations cleared up through education and cooperation, rather than legislation, whenever such is possible.

* The writer is research professor of entomology and extension entomologist at the Utah State Agricultural College, Logan, Utah.

Wild Bees as Supplementary Pollinators

by W. W. Franklin*

THERE are several groups of "wild bees" that affect legume seed production. Some of these are found throughout the United States, others are found only locally. Some of the more important of these pollinating insects in Kansas are as follows: leaf-cutting bees, bumble bees, hairy flower bees, carpenter bees, and several species of bees of lesser importance.

The small leaf-cutting bees of the genus **Megachile** visit untripped flowers almost exclusively. Occasionally, they visit a flower that has been tripped. When that occurs, they do not linger but go on to an untripped flower. When visiting the alfalfa flowers, they fly straight into the flower selected. These flowers are usually on racemes one-fourth of the way down from the top of the plants.

The characteristic action of the small leaf-cutting bee is to place the head against the standard petal, place one or more of the legs upon the keel petals and push. This action forces the keel petals apart and releases the staminal column. Some leaf-cutting bees fly to another flower immediately. Others obtain some nectar from the tripped flower, while some pause to clean the pollen from the ventral side of the body. The prothoracic and the mesothoracic legs are used in removing the pollen from the body and the metathoracic legs are used to pack the pollen on the underside of the abdomen.

The leaf-cutting bee is so small that the mesothoracic and the metathoracic legs are sometimes used to tread on, claw, and push the keel petals. If the leaf-cutting bee visits the flower in such a manner that the body is perpendicular to the standard petal, the staminal column when released strikes the first few abdominal segments. In all instances observed, the staminal column sprang up under the body and did not strike the standard petal until the bee flew to the next flower.

Most of the time the leaf-cutting bee visits the flower from one side or the other. In such cases, the head is placed against the standard petal and the flower is tripped when the bee uses the prothoracic or the mesothoracic leg or both to claw the keel petals. The staminal column strikes the side of the thorax and head as it is released. The leaf-cutting bee cleans itself of pollen, packs it on the pollen basket located on the ventral side of the abdomen and proceeds to the next flower. Sometimes the leaf-cutting bee hovers to finish cleaning itself before proceeding to the next flower. If the pollen collected is too great to be cleaned up in the short space of time in going from one raceme to another, and if the pollen has accumulated on the upper parts of the body to a large degree, the leaf-

* Assistant Professor of Entomology, Kansas Agricultural Experiment Station, Fort Hays Branch, Kansas State College, Hays, Kansas.

cutting bee alights on a leaf, and cleans the thorax and the head of pollen.

Bumble bees and carpenter bees, being about the same size as alfalfa racemes, trip a number of the flowers visited by walking over the racemes. The legs are accidentally placed on the tripping mechanism, causing the flowers to be tripped. Tripping occurs more often by this method when there is considerable wind and the bumble bees are required to hold on to the flower. Bumble bees visit most of the flowers on the raceme and trip them by placing the prothoracic legs on the petals to pull themselves along, or by thrusting the tongue through the throat of the flower. In nearly all cases, except where tripping occurs due to walking over flowers, tripping is caused by the tongue. When the tongue is thrust into the flower it presses on the base of the keel petals with sufficient force to release the staminal column. When released, the staminal column strikes the underside of the head, glances off to one side and strikes the standard petal. Often the bumble bee thrusts the tongue over the top of the standard petal and down into the flower. In this case, the long tongue bends, causing it to touch the keel petals and tripping results. In this case, the staminal column strikes the face of the bumble bee.

The hairy flower bees (genus **Melissodes**) visit a number of the flowers upon the raceme before moving to the next raceme. Some of the larger species trip flowers occasionally while walking about the racemes. This tripping occurs more often when the metathoracic legs are placed upon the keel petals to thrust the body forward. The small species touched the tripping mechanism less often while walking on the flowers than did the larger species. Occasionally, the hairy flower bees trip alfalfa flowers with their tongues. However, most of the flowers are tripped by clawing and scratching the keel petals. This is usually done with the prothoracic legs. Those hairy flower bees which visit the lighter colored, almost white flowers, trip fewer of them than of the deep purple flowers. If they are frightened from the dark purple flowers, where they are tripping almost half of the flowers, and alight on white flowers, they visit fewer flowers on the racemes; also, fewer white flowers are tripped. In a number of cases the **Melissodes**, seemingly, made no effort to trip the flower but inserted the proboscis in at the side of the flower in the same manner as the nectar-gathering honey bee.

As useful as these "wild bees" are for pollination purposes they have decreased in population to the point that they are no longer effective pollinators. In 1945, a total of 554 bumble bees were observed visiting alfalfa flowers near Manhattan, Kansas. In 1946, the number fell to 273 and in 1947 only 255 were observed. In 1948, 244 bumble bees were observed visiting alfalfa flowers near Hays, Kansas. In 1949, only 90 were observed; in 1950, 27; and in 1951, 46 bumble bees were found.

The population of the leaf-cutting bees also fluctuates greatly. The population at Manhattan, Kansas, in 1945, 1946, and 1947, was 290, 380, and 587. In 1947, they could be found with ease. The population at Hays, Kansas, in 1948 was 311 while in 1949, it was 136. In 1950, the population fell to 60. In 1951, only four were found.

The population of the hairy flower bees also varied. The population at Manhattan, Kansas, in '1945, 1946, and 1947, was 38, 99, and 333. At Hays, Kansas, in 1948, 1949, 1950, and 1951, the population was 45, 132, 19, and 16.

S. W. Edgecombe Heads New School

S. W. Edgecombe, head of the Department of Horticulture, Utah State Agricultural College, is now recruiting personnel for the new School of Agriculture which he is to head at the American University of Beirut, Beirut, Lebanon. The Ford Foundation has made a grant of half a million dollars to erect buildings, equip them and purchase land for research purposes to start the school. The Technical Cooperation Administration of the United States is supplying 160 thousand dollars for operating expenses for a two-year period.

The objective of the school is to train promising leaders of the countries from Greece to India in agriculture in hopes that they will return to their countries and raise the level of production and total agricultural production so that their people will be better nourished than they now are.

The first class of thirty freshmen students will enroll next October. They will be selected from the various countries in the area and represent potential agricultural leaders.

An ambitious plan of agricultural research is planned. Also cooperation on agricultural problems will be given to the Point 4 program and the various governments.

"Perfection in beekeeping is not found in a multiplicity of appliances but in simplicity and in the elimination of everything not absolutely essential." Brother Adam in "Bee World."

A World Bee Library

Dr. Eva Crane, editor of "Bee World," which was published by the Apis Club until this year when it was taken over by the Bee Research Association, is desirous of expanding the library facilities of that world functioning group.

Any of our readers desiring to help by donating pamphlets, books or magazines on beekeeping will please get in touch with Dr. Eva Crane, at Newland Park, Hull, Yorks, England, and give a list before mailing.

HELP CANCER RESEARCH

An opportunity for beekeepers to help in cancer research is now open. Through the efforts of Charles Mraz of Middlebury, Vermont, the Sloan-Kettering Institute has decided to promote cancer research with pollen, royal jelly, bee venom, and so forth. This means an investment of thousands of dollars and all beekeepers can help by supplying the Institute with royal jelly.

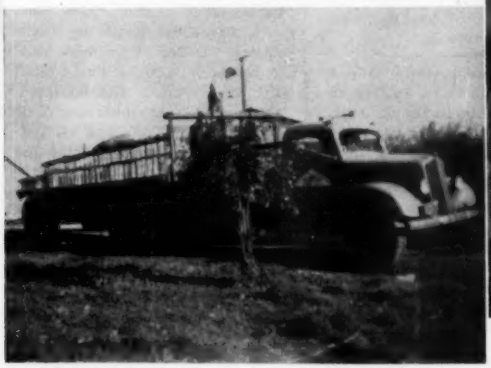
Collecting the jelly is a simple process. The cells are simply cut out of the combs and put into a box. They are then taken home, the larvae taken out and the jelly squeezed into a tight jar. This is kept in a refrigerator until filled. It can then be shipped, well packed, direct to:

Dr. C. Chester Stock, Sloan-Kettering Institute for Cancer Research, 444 East 68th St., New York 21, N. Y.

Let's do our best to help this vital project.

Loyd Ravenstock (at the left) took this picture (or told the shot). At the right is the senior Rocke (father of Rocke Brothers, Rocke Apiaries, Eureka, Ill). They are honey producers and honey packers and distributors. They use their own distinctive jar and label and take considerable pains to turn out a quality product which finds much favor in their markets. Year by year the business grows. And so it should.

The Ohio Evergreen variety of sweet clover is of special interest to beekeepers. Indications are that it can be expected to bloom over a long period, continuing after the common biennial sweet clovers are through. It is known to have furnished good bee pasture for three months. Certified seed of this variety is now produced.



They're still making honey out in Yuba City, Calif. To prove it Don J. Strachan of the Geo. E. Smith Apiaries sent us this picture. On the truck are 668 five-gallon cans of star thistle honey, part of the 1950 crop which totaled about 2130 cans. If conditions continue to look good, our friends in California may have some record crops to show us for 1952.

L. J. Jordan, Lancaster County, South Carolina, sent this picture of his fair booth about which he writes: "In former years we flooded our booth with honey and equipment. This year we tried for simplicity and won first prize. The little train pulled a box car with our label on the door and the gondola car contained two small tankers (jars of honey). The observation hive attracted attention as well as the individual jars containing comb honey made in the jars. I make sales both to individual and merchants as a result of this advertising."

The Control of Wax Moth*

by Dr. V. G. Milum

This is the third and last of a series of articles on wax moth control. The first two appeared in April and May. We are glad this article could be included this month instead of delaying it until the August issue.

THIS seems like a simple title for one of the more serious problems that confront beekeepers around the world. But complexity is involved in the term "wax moth." In a previous issue, it was pointed out that the larvae of eight different species of moths, the adults and larvae of a family of beetles (Dermistidae) and the larvae of the bee louse, **Braula coeca**, all are known to commonly infest the combs of honey bees or have been reported on isolated occasions. The moths include the greater wax moth, the lesser wax moth, the Indian meal moth, the Mediterranean flour moth, **Vitula edmandsii** (common in nests of bumblebees), the dried fruit moth (**Vitula serratilineella**—a close relative of the latter), the almond moth (Ephestia cautella), and **Aphomia sociella.** The descriptions and habits of the adults and larvae of these various species were given in a preceding article.

However, in the case of wax moth infestation of the combs of honey bees, it is not necessary to know the species involved in order to apply a control. An entomologist in prescribing a control for a particular infestation of insects usually makes an early attempt to determine the scientific name of the insect involved. Knowing the common name only is sometimes confusing for often a certain species of insect has a different common name in various parts of the country. Unfortunately, in our opinion, the common name, wax moth, has been officially adopted by entomologists for **Galleria mellonella** (L.), which is generally known as the greater wax moth. In this discussion, I shall use the latter name to distinguish it from the seven other species of moths known to have infested the combs of honey bees. Furthermore, it may be pointed out, that none of the species listed actually obtain any nourishment from the wax itself, rather destroying wax and combs while seeking pollen, the cocoons of bee larvae which line the cells of the comb, cast larval skins and waste materials in the bottom of the cells, and in some cases dead bees and brood. Although the larvae of some of these species feed upon and damage comb foundation, it is doubtful that adults could be developed upon pure wax as secreted by honey bees and never contaminated by the products of brood rearing. In one of my early articles on wax moths, I cited our experiments in placing partially developed larvae (early instars) on comb honey with the result that they grew smaller and smaller, eventually perishing if they did not have access to some pollen, some brood comb, or some dead insects to give them a supply of protein.

Of the eight species of moths listed, many are of no economic importance since they are seldom found or at least not often recognized as distinct species. Besides, the ordinary precautions for the control of the greater wax moth, the arch enemy among them, eliminates any damage danger. Although **Aphomia sociella,** common in bumble bee nests in Europe and occasionally in combs of honey bees, was introduced to America via Nova Scotia and found in Massachusetts in 1923, it has never been reported from honey bee combs in this country. Likewise, **Vitula serratilineella,** the dried-fruit moth, is rare, with a single infestation reported from British Columbia in 1920. The almond moth has been reported by Dr. C. L. Farrar from Laramie, Wyoming, and I have observed its habits on honey bee combs in artificially established cultures.

The feeding habits of these last two species as well as the Indian meal moth and the Mediterranean flour moth, all of which feed upon stored products, suggest some preventive measures in their control. The odinary food materials of each, which were listed in our previous articles, should not be stored in the same building with honey bee combs, especially market section and bulk comb honey, or the development of a source of infection in the other food product should be thoroughly controlled. The Indian meal moth is the most dangerous of this group, particularly with respect to section and bulk comb honey.

While the Mediterranean flour moth has often been listed as a pest of honey bee combs, this writer is very suspicious of this charge, unless determinations were made by an expert, and we do not presume to qualify. The adults of three species, the Mediterranean flour moth, the dried-fruit moth, and **Vitula edmansii** are so alike in size and color pattern that only by clearing the wings can a determination be made. Likewise, the larvae are so similar that specific determination requires a microscopic study of the location of the hairs and pigmented areas on the surface of various segments. Even the adults and larvae of the almond moth have some similarities to these three species. Add to this the fact that the females of the Mediterranean flour moth are not readily attracted to honey bee combs for egg laying, although development of adults is possible if pollen is present in the combs in which cultures are established.

This writer, as indicated previously, believes that the more common larval pest in bumble bee nests, **Vitula edmandsii,** is the most likely of these similar species to be encountered since bumble bees are quite widespread and the larvae of **edmansii** are able to survive freezing temperatures. In our studies of pests of honey bee combs, never have specimens of the Mediterranean flour moth been submitted, but living specimens of **edmandsii** found feeding on honey bee combs have been submitted from Nebraska, and Manhattan and Hall, Montana. In the latter instance, L. H. Walling

(Please turn to next page)

* Contribution from the Entomological Laboratories of the University of Illinois.

reported that the larvae survived in an unheated honey house with temperatures well below zero, with considerable damage to combs containing pollen. Richmond has reported **edmandsii** as a pest of comb honey in Colorado.

The lesser wax moth seems to have been given a suitable common name for not only is it smaller than the greater wax moth but its economic importance is far less, although its distribution is apparently scattered but world-wide in temperate and tropical climates. Actually many beekeepers within its range do not recognize it, although many falsely attribute to it some of the damage on section and bulk comb honey. Likewise errors are made in labeling as the lesser wax moth the small adults of the greater wax moth that result when there is a lessened supply of nutrient materials with succeeding generations on the same set of infested combs. In personal correspondence, Dr. Eckert, of California, has cited an interesting example of this phenomenon observed during a visit to Hawaii. He reported that he never had seen such destruction to combs by the wax moth as on Oahu and Molokai, stating further that if a colony dwindles in strength during any portion of the year and cannot cover all of its combs, the wax moth moves in and most frequently takes over. Apparently under the favorable weather conditions, so far as temperature is concerned, enormous populations of the greater wax moth had developed, but with a restricted food supply and constantly recurring generations, only the stunted adult moths were being produced.

The greater wax moth is the most universal despoiler of the combs of the honey bee, but even it is not a pest in some northern beekeeping areas and in portions of our intermountain states. But where this moth is present, certain characteristic habits combine to make it a serious pest. In addition to laying eggs in cracks and crevices where they are protected before hatching, the numbers are enormous, as many as 1800 having been reported as being laid by a single female. We were skeptical of this great number until we counted 1610 by a single female in captivity over a period of fifteen days. While a few larvae of the first generation which have escaped the bees in a hive may cause only appreciable damage, the possibilities in the second and third generations are serious if a male and female live to maturity and egg laying follows in weak colonies or supers of empty or full combs removed from the bees and stored at favorable developmental temperatures.

Another factor in the control is that most fumigants do not kill the eggs. If the eggs are not all hatched at the first treatment, then another application should follow. But the interval between should vary according to temperature conditions. Ten days has been given by Paddock as the length of the egg stage in Texas, but with colder temperatures prevailing, this period could be considerably extended or even shortened with uniformly high temperatures. It has been reported, in the case of the lesser wax moth, that the eggs hatch in 5, 10, and 22 days at temperatures of 86° F., 68° F. and 60.8° F., respectively, but are killed above and below these limits.

Another condition that leads to misunderstanding and subsequent losses, is that many persons think that supers from strong colonies cannot possibly have any moths in them. But there may be eggs safely protected in cracks or crevices or even tiny newly hatched larvae may be roaming freely over the combs. We doubt if bees can see, much less catch, these speed demons until they settle down to feed in a definite location. But occasionally, even in the strongest of colonies, a larva may escape the vigilant workers by tunneling beneath the cappings of brood. In most cases, the bees eventually catch the culprit. Reports from the Rothamsted Experiment Station in England indicate that the so-called "bald brood" is the result of wax moth larval feeding beneath the cappings. In contrast, on at least two occasions, we have noted uncapped young adult bees that were unable to crawl from their cells. Investigation showed that they were anchored to the bases of the cells by the webbing of a greater wax moth larva tunneling next to the comb midrib.

Some of the factors in the control of comb infesting larvae have already been indicated. For some of the species it seems to be simply a matter of eliminating another breeding ground or material such as the cereal foods. But with the greater wax moth which most often must be controlled, other more drastic means are necessary. Since strong colonies usually resist the invasion of the larvae of any moth, good beekeeping practices are usually sufficient so far as combs on colonies are concerned. Weak colonies, especially of common black bees, are less thrifty in resisting the inroads of the moth larvae. Sometimes when the larvae and their webbing become abundant, the depleted colony of bees may actually cast an absconding swarm because of the obnoxious odors. Queenless colonies and those greatly depleted in number of worker bees by the inroads of American foulbrood are especially open to destruction. Southern queen breeders and package bee shippers report that any weak nuclei are soon destroyed by wax moth larvae. As nuclei must be kept strong, all colonies should be examined periodically to make sure that they are in good condition, queenright, and free from disease. A wide-awake, well-informed beekeeper need have little fear of serious wax moth damage to any combs protected by strong colonies.

In areas where freezing temperatures occur at frequent intervals, there is little danger of wax moth injury when combs are removed in late fall from strong colonies and stored outside or in unheated sheds. This is also true during the summer if extracting combs are removed from colonies, extracted within a few days and the wet combs returned immediately to the colonies for cleaning. This practice has the further advantage of having the combs free of all dextrose crystals which lessens the danger of granulation of the new crop. However, wet extracting combs should not be put on colonies in late fall after freezing temperatures prevail. Small clusters of bees may become stranded on the combs and perish. In two instances we have had the entire colony move to a new position and later perish from starvation during a freezing period with plenty of honey above the former clustering space.

Whenever extracting combs, bulk comb or section honey are removed and stored at ordinary room temperatures, fumigation for wax moth control must be practiced. Before discussing the various materials used for fumigation, let us call attention to the fact that after fumigation, the combs should be stored in a wax moth-free room or else further eggs may be laid in the cracks and crevices of the supers or other containers and another infestation with

serious damage may result. This is especially true of bulk and section comb honey which should not be stored at freezing temperatures but preferably near or slightly above 70-75° F. to retard granulation. A higher temperature should be avoided to prevent discoloration of the honey. Extracting combs are most economically and safely stored where subjected to freezing temperatures unless there are provisions for safe mass fumigation. This last statement is true so far as all species of moth are concerned except **Vitula edmandsii** which is not killed by freezing temperatures, the larvae surviving and feeding during the winter whenever temperatures warm up again. But in regions where this species is a serious pest, one fumigation before winter would be sufficient where combs are not stored at warm temperatures.

The materials most commonly used for fumigation are the following: carbon disulphide, calcium cyanide, methyl bromide, and the fumes of burning sulphur. Each of these materials has its advantages and disadvantages which will be discussed under the general directions to follow for the use of each. Other materials sometimes used are paradichlorobenzene (PDB), naphthalene, and chlorosol. Chlorosol has a tendency to stratify. The first two are expensive in effective amounts and all are not particularly satisfactory because of their slow volatilization or release of gas except at high temperatures. Thus there is a tendency to have insufficient concentration of gases. Furthermore, fumigated honey has a tendency to absorb some undesirable odors. Some comb honey producers have incurred serious economic losses through the use of PDB.

Carbon disulphide (CS_2), which is a satisfactory and commonly used fumigant, is a liquid which volatilizes readily and its fumes are heavier than air. Although it is toxic to humans only if breathed in large amounts, care in this regard should be practiced. It is both explosive and inflammable at certain concentrations. Care must be taken to avoid any sparks or fires near it if used inside a building. We have used it for over thirty years without accident. Tiers of hive bodies or supers, up to 5 or 6, can be fumigated with carbon disulphide if they are stacked above a metal cover with a shallow dish of the liquid placed in a covered body at the top. The fumes sink toward the bottom of the stack. The edges of the supers should fit very closely. Best results are secured by sealing the edges with strips of gummed paper or by wrapping tightly with several thicknesses of newspaper. One tablespoon (10 cc.) of carbon disulphide is required for each ten-frame super or hive body. For large scale fumigation, 10 pounds per 100 cubic feet is required. Since all stages except the eggs are killed by CS_2, a second fumigation should follow in ten to fifteen days, depending upon the hatching of the eggs.

Methyl bromide (CH_3Br), when obtainable and if used with care, is sometimes recommended because it kills all stages including the eggs, although the rate of killing is extremely slow. While it is noninflammable, it is somewhat toxic to the skin and otherwise dangerous because of a slight chloroform odor which makes it possible to unknowingly inhale toxic amounts. While it has been pointed out that methyl bromide is less dangerous than using hydrocyanic acid gas (HCN), the manufacturers recommend the use of a gas mask. It boils at 40° F. so it readily disperses, but it does tend to stratify. Best results are obtained with a tight fumigation chamber. It can be used for fumigation for large storage rooms with bodies of combs if a fan is provided to disperse the fumes throughout the room and the piles of supers are raised from the floor so there is complete circulation of air and gas. The fumes should be released into the storage chamber by means of a tube or pipe provided with a suitable valve opening to which the cylinder of methyl bromide may be safely and tightly attached. Danger warning signs should be posted. To avoid further danger, after fumigation, extreme care should be exercised to ventilate the fumigation chamber or room. In large scale fumigation, from 1 to 2½ pounds per 1000 cubic feet for 12 to 16 hours is recommended. The amounts required depend upon the length of exposure and the tightness of the fumigation chamber. Methyl bromide is sold in one-pound cans and 10, 50, and 150 pounds net cylinders.

Calcium cyanide (Cyanogas, Calcyanide), either in the dust or flake form, in the presence of a moist atmosphere, generates hydrocyanic acid gas (HCN), a deadly poison, the fumes of which are not easily detected. The flake form is often used for gassing of diseased colonies, a teaspoonful of the flakes being pushed into the colony entrance which is then closed tightly. For a stack of 5 or 6 hive bodies, ½ ounce or 1 tablespoonful is sufficient if the cracks are sealed with gummed paper. In the open there is little danger to humans if due care is taken not to inhale the fumes but when calcium cyanide is used for fumigation of rooms or a honey house, a tested gas mask charged for HCN should be worn, danger warning signs should be posted, and after fumigation the building should be thoroughly aired before anyone is allowed to enter. Single rooms in a house cannot be fumigated without evacuating all humans from the house. The dosage per 1000 cubic feet is 12 ounces of 88 per cent calcium cyanide (Calcyanide). There have been fatalities, so if you should use it, do be careful.

Sulphur dioxide (SO_2) gas, the fumes of burning sulphur, will kill the larvae, pupae and adults of wax moths, but it is not effective against the eggs nor does it always kill larvae and pupae in cocoons. About two ounces of sulphur is moistened with wood alcohol and placed in the bottom of an empty super. It is then ignited and five or six supers are stacked above with a cover on top. Large storage rooms can be fumigated quite cheaply, with 4 to 8 pounds of sulphur per 1000 cubic feet being required. The necessary amount of sulphur is placed in a suitable receptacle and ignited. Since fire is involved, extreme care is necessary to prevent overheating or igniting of combs and wax which may result in serious losses from burning of the honey house. The gas is poisonous and metal objects are tarnished if exposed to it.

Pollination Figures

"Alabama Seedsman" reports that more than 1,700 colonies of bees were used in crimson clover seed production in Alabama in 1951, and that their use improved seed yields of crimson more than 65 pounds to the acre, average. In one experiment at Alabama, AES clover with bees produced more than 400 pounds more of seed than similar plantings under cages. Hairy vetch increased in seed yield in Arkansas from 160 to 240 pounds per acre, no reason given. Bees, no doubt.

Ion-Exchange Resins in Honey Processing

by T. C. Helvey

Office of Apiculture, Cornell University, Ithaca, N. Y.

The author of this progress report has become deeply interested in the physical chemistry of honey and honey processing. Research on honey at Cornell is financed by the Cornell Research Foundation. Some years ago the Foundation patented the Dyce process for preparing crystallized honey, and funds from royalties paid by honey packers licensed to pack honey under the process are used to increase our knowledge of honey.—Ed.

THERE are several techniques used by honey processing plants to improve the quality of dark or off-flavored, second-grade honey. This problem is of considerable importance where buckwheat is the major honey crop.

It was found long ago that the dark coloring matter in fresh buckwheat honey is a proteinlike substance which is in a colloidal state suspended in the honey. With a measurement of electrocataphoresis of honey the isoelectric point of these colloids has been found to be close to pH 4.3. At this point the colloids will flocculate, especially when the honey is heated to about 160°F., and so this material can be filtered out.

The general procedure in honey processing plants, in which de-colorization and deflavorization of honey has been carried out, has been the addition of milk of magnesia or calcium hydroxide to the diluted honey to raise the pH to 4.3.

This process is objectionable for various reasons. The major objections are that the addition of calcium hydroxide causes an unpleasant taste; furthermore it has been found that honey processed with the addition of calcium or magnesium hydroxide will darken faster in subsequent storage. Last but not least, through the addition of lime hydrate and the later adjustment to restore the original pH, the ash content of the honey will be raised beyond the limits set by the food and drug regulations.

This laboratory has undertaken the problem of developing a process whereby the dark colloidal material of honey can be eliminated without any addition of foreign materials. It has therefore been necessary to search for a suitable process in the field of physics or physical chemistry.

It is well known that through the addition of water the pH of an acid solution can be raised. This however can not be applied to honey because honey possesses a buffer action, and the amount of water necessary to adjust the pH to 4.3 is so large that the reconcentration of the honey after treatment would be beyond the limits of economy.

The precipitation of colloids in honey can be carried out by the addition of oppositely charged inert colloids such as clay or other zeolites. This problem has already been investigated, but it has among others, the shortcoming of being a discontinuous process. It can be carried out only in batches, and leaves, with the equipment so far tested, a certain residue of the added material in the honey.

The possibility has been investigated of running the honey through a column filled with coarse charcoal having the opposite electrical charge to that of the colloids of honey. In this process the honey colloids will precipitate on the charcoal surface without the adjustment of the pH to the isoelectric point. This process can be applied on an industrial scale and involves low expense. Unfortunately the process is slow and for a large capacity a large investment would be necessary. The research and experiments in this direction are not yet completed and improvements are in progress.

Being investigated thoroughly also is the application of ion-exchange resins. With the use of resins which will exchange hydrogen the pH of the honey can be raised easily to 4.3 in a continuous process. Of course temperature, dilution and the rate of flow have to be thoroughly controlled. The resin bed can be operated at elevated temperatures, and consequently the colloids will flocculate and will be filtered out to a large extent on the charcoal which is admixed with the resin or can be eliminated by a rotating vacuum filter or a filter press. A second resin bed will restore the original pH of the honey, which then can be reconcentrated in a vacuum pan. This process, of course, is not as simple as described because certain factors must be controlled exactly. For example, a particularly skilled hand is needed in case the resin bed must be partially exhausted with strong acids to prevent the elimination of the organic acids present in the honey which are so important in the formation of the proper honey flavor. However it may be feasible to lose a little in flavor but gain much in the keeping qualities of the honey, because the resin-bed could also eliminate the amino acids from honey which are blamed for the formation of dark-brown colored compounds in stored honey. Other organic acids of honey such as formic, oxalic, malic, etc. probably also add to the darkening because they too may form brown compounds with sugars, as has been proven with citric acid.

The results obtained so far in the laboratory are encouraging, and the results of these experiments, still in progress, will be published later.

Summer Beekeeping Program
University of Massachusetts
July 12

Massachusetts Beekeepers can look forward to an interesting and informative program on July 12 at the University of Massachusetts.

Featured speakers will include C. A. Jamieson who is in charge of research on beekeeping for the Dominion of Canada. It is expected that Mr. Jamieson will discuss recent work on the control of bee diseases.

A second speaker will be Roger Morse, Cornell University. Mr. Morse has made an exhaustive study on the use of honey in various beverages and will discuss this subject.

Mr. J. R. Hepler, University of New Hampshire, will complete the list of speakers. Mr. Hepler will compare some of the old and new practices of beekeeping in this country.

All people interested in bees are welcome. Ample time will be allowed for questions. It is hoped that beekeepers from other New England states will take advantage of this program.

F. R. Shaw

Short Course
Pennsylvania State College
August 18-22

A Beekeeping Short Course will be conducted at The Pennsylvania State College from August 18 to 22, 1952. One-half of each day is given to lectures on the theory of beekeeping, and the other half is devoted to the practical application of bee management. The course is planned to aid those interested in beekeeping to increase their income, or to render a greater service where pollination is required.

Emphasis will be given to spring management, swarm control, queen rearing, disease control, and the marketing of honey.

For further information, and an application blank, write to A. Leland Beam, Director of Short Courses, School of Agriculture, State College, Pa.

Annual Picnic
S. E. Minnesota Beekeepers
Cannon Falls, July 13

The S. E. Minnesota Beekeepers Association will hold an annual picnic at Banker's Honey Market on July 13. The Honey Market is located six miles south of Cannon Falls on U. S. 52.

A pot luck picnic lunch will be served at 12:45. Coffee and ice cream will be furnished by the association. Bring your own dishes and silver, and a hot dish, salad or sandwiches.

Robert Banker, Pres.

Westchester County Assoc.
New Rochelle, N. Y., July 20

The Westchester County Beekeepers' Association will hold its regular monthly meeting at 2:30 p.m., July 20 at the home of Mr. Frank Burgmaier, 52 Willoe Drive, New Rochelle, N. Y. Following the meeting our host's hives will be inspected. Refreshments will be served, and everyone is cordially invited to come.

Carlton E. Slater, Publicity

Four-State Meeting
Postville, Iowa—July 15
At Big-4 Fair Grounds

9:00—Registration
10:00—Games and Contests—Henry W. Hansen, M. C.
Frame nailing (men and women)—bring your hammer
Smoker lighting (men and women)—bring your fuel
Spike nailing contest for women
Wheelbarrow race for men
Three-legged race for children
11:00—Cooking Exhibit—prizes
Seed Exhibit, featuring legume seeds
12:00—Pot Luck Lunch
Irving T. Hartung, Chairman
1:30—Producing Queens — J. W. Newton, Baton Rouge, La.
2:00—This Beekeeping Business—Henry Schaefer, Osseo, Wis.
2:30—Looking Ahead—F. B. Paddock, Ames, Iowa

Kane-DeKalb Association
Elburn, Ill., July 27

The Kane-DeKalb Beekeepers Association will have a meeting on Sunday, July 27 at the apiary of Ross Morrill, Rt. 1, Elburn, Ill. This is on the Kaneville Road near Route 47. Mr. Morrill will exhibit miniature bee hives which are exact copies which he has made of hives from all over the world. There will also be observation hives of all races of bees shown. Mrs. Klebes will be the "Bearded Lady" using a large swarm of live bees. There will be a large display of honey cookery. This meeting is intended to show the public bees and honey, and how honey is used in cooking.

Ralph Klebes, Pres.

Wisconsin Summer Meetings
July 22 - 23

The summer meetings of the Wisconsin Beekeepers Association will be held this year on the following dates:

July 22—Tuesday, at Walter Diehnelt's Honey Acres, Hy. 166, Menomonee Falls, Wis.

July 23—Wednesday, at Eau Claire Lakes Park, Hy. 27, north of Augusta, Wis. There will be demonstrations and outstanding speakers at both these meetings. A pot luck luncheon will be served at noon. All beekeepers are welcome.

Annual Summer Meeting
Minnesota-N. Dakota
Detroit Lakes, Minn., July 25-26

The Minnesota and N. Dakota Beekeepers Associations will hold their annual summer meeting at Detroit Lakes on July 25-26. A pot luck picnic lunch will be served at noon on July 25. Bring your own dishes, silver and a hot dish, salad or sandwiches.

A smoker lighting contest will be staged in the afternoon on the 25th and a Fun Fest the evening of the 25th. Any and all beekeepers are invited whether they are members or not.

Robert Banker, Sec'y
Minnesota Association

(Please turn to next page)

DADANT'S
STARLINE HYBRIDS
Package Bees
and
Queens
Reg. U.S. Pat. Off.
C. G. WENNER
Glenn, California

HOLLOPETER'S QUEENS

Reared in the North from Northern stock full of vim, vigor and vitality. This strain of Italians has stood the test of forty years in the hands of beekeepers everywhere and will please you.

Prices: Untested queens, 1-9, $1.00 each; 10-24, 90c; 25-49, 80c; 50-99, 75c; 100 or more, 70c each.

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Cut Comb and Extracted
Advise what you have
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WAXAHACHIE, TEXAS

Palmetto Quality Queens
On same old basis, Quality, Service, Satisfaction.
Three-banded Italians only.
June Prices
1 to 5 ..... 75c each
6 to 10 ..... 70c each
More than 10 ..... 65c each
No disease.
C. G. ELLISON & SONS
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FREE...
A Sample Copy
"Gleanings in Bee Culture"
LOOK IT OVER
YOU WILL LIKE IT
A. I. ROOT CO., Medina, Ohio

American Rabbit Journal
Shows the Way to Success
Gives the latest news and views of the rabbit world—an illustrated monthly magazine of general and educational features. 1 year, $1.00; 3 years, $2.00; sample 15c.
American Rabbit Journal
DEPT. S. WARRENTON, MISSOURI

Dadant's for Honey Labels
—Send for complete catalog

New Officers
Connecticut Beekeepers Assoc.

New officers of the Connecticut Association elected at the annual meeting in April are: President, William J. McCormick, Stratford; Secretary, Mrs. Andrew Creevy, Stratford; Treasurer, Charles J. Rost, Meriden; Publicity Chairman, Philemon J. Hewitt, Jr., Litchfield.

At this meeting the program for the annual six-meeting bee school was planned. It is being held at the New Haven Experiment Station, New Haven, Conn., and the dates are Sundays, May 4, 18, June 8, 22, July 13 and September 7 at 2 p.m. rain or shine. This course is free and all are welcome.

Philemon J. Hewitt, Jr.,
Publicity

Virginia State Beekeepers Assoc.
Lynchburg, August 6

The Virginia State Beekeepers Association will meet for their summer picnic meeting in Miller Park, Lynchburg, Virginia.

The group plans to get together about 11 a. m. on Wednesday, August 6, 1952, and have lunch. Following this, there will be talks and contests for everyone. Bring your smoker and favorite fuel without additives, such as oil and grease.

John M. Amos, Sec'y

Iowa, Nebraska, Minnesota, and South Dakota Summer Meeting
At Sioux City, Iowa
July 12, 1952

9:00—Registration and open house at Sioux Honey Association
10:00—Leave for South Ravine Picnic Area—Henry W. Hansen, Dakota City, Iowa
11:00—Contests—
Frame nailing for men
Frame nailing for women
Smoker lighting for men
Smoker lighting for women
Spike nailing for women
Three-legged race for children
Wheelbarrow race for men
12:00—Lunch (Pot Luck) Lemonade and Coffee furnished by Sioux Honey Moderator—Ed Wolfe, Atlantic, Iowa
1:30—Advertisement — Bryne Marcellus, Chicago, Ill.
2:00—Price Support — Harold Clay, Washington, D. C.
2:30—Pollination — James Hamilton, Los Angeles, Calif.
3:00—Need of Organization—M. G. Dadant, Hamilton, Ill.
Tug of War

Colorado Beekeepers Assoc.
Summer Meeting, Greeley, July 7

The CBA summer meeting is to be held July 7 at the Island Grove Park, Greeley. The Board of Directors will also meet Monday. Tuesday morning, July 8, the Colorado Honey Administrative Committee will meet in conjunction with the CBA. Tuesday afternoon will feature a picnic, games and discussions. All beekeepers, their families, and anyone interested in beekeeping are cordially invited to come.

"B Notes"—May 1952

Middlesex County Beekeepers
Harvard, Mass., July 26

The July meeting of the Middlesex association will be an outdoor meeting to be held at the home and apiaries of member William Maxant at Harvard, Mass., on July 26, at 2 p.m. The club hive which was started at the last indoor meeting at Waltham will be examined for progress as well as some of Mr. Maxant's hives.

John H. Furber, Sec'y

Tazewell Beekeepers Assoc.
Mackinaw, Ill., July 13

The Tazewell Beekeepers Association will meet on July 13 at the country place of Paul Bourscheidt in Mackinaw. There will be a basket dinner at 1 o'clock. Directions will be sent in ample time.

Joseph Jackman, Sec'y

North Carolina Summer Meeting
Cullowhee, July 18-19

The North Carolina State Beekeepers Association will hold its annual Summer Meeting at the Western Carolina Teachers College at Cullowhee on July 18 and 19. Arrangements are being made for an outdoor barbecue and for attendance at the famous Indian Drama "Unto These Hills." Rooms will be available in the college dormitories at approximately $1.00 per day per person and meals will be furnished at a nominal charge. Reservations should be made as soon as possible by writing to W. A. Stephen, Extension Beekeeper, N. C. State College, Raleigh, N. C.

An excellent program including speakers of national reputation is being arranged by Mr. Stephen. Local arrangements are under the direction of P. J. Gibson, County Agent. Beekeepers and friends are urged to come and bring their families. The mountains are excellent for a cool, relaxing vacation.

Eugene B. Finch, Sec'y

25% DISCOUNT
Off Prices Below

Our Famous Strain of
Yellow Italian Queens

Lot 1-5, $1.35; 5-15, $1.30; 15-25, $1.20; 25-100, $1.15; 100 up, $1.05.
Select tested $5.00 (no discount)

The Daniels Apiaries
Picayune, Miss.

ITALIAN QUEENS
Pure mating guaranteed
$1.00 each
W. E. PLANT
Hattiesburg, Rt. 2, Miss.

YELLOW
Italian Queens and Bees
I want to thank each and every customer for the business they have given me. It has been a pleasure serving you, let me do so again next season. 100% more colonies next season for better shipping dates.
Will have queens until Sept. at 55c each air mail.
JOHNNIE ARNOUVILLE
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CARLOADS AND LESS THAN CARLOADS
Send samples and quote best cash price delivered to us. All grades.
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Hardy, prolific, rapid build-up, best of workers. Caucasians have the longest tongue of any race. Both build beautiful white combs. **BOTH ARE THE GENTLEST OF ALL RACES OF BEES.** Gentleness is safest in towns, near neighbors or near streets or highways. Gentleness saves time, sweat, patience and work. Prices, both races: Untested queens $1.00 each. Tested queens $1.75 each. By Air Mail. Lower prices in quantity. Ask. A few Caucasian Breeding Queens.
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ITALIAN BEES AND QUEENS

2-lb. pkg., each	$2.50
3-lb. pkg., each	3.50
4-lb. pkg., each	4.50
Nice Large Queens	
1-99	$0.55
100 up	.50

All queens are honeys for producing honey.
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Dadant's Starline Hybrids
They have been called "The Bees of the Future." They are of the Finest.

1-24	$1.20
25-99	1.15
100-499	1.10

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Garon's 3-Banded Italians
Backed by over a quarter century of experience. Let us serve you at these reduced Summer prices.

1-24	70c
25-99	65c
100-499	60c

Queens clipped and painted and Air Mailed upon request.
GARON BEE CO. Donaldsonville, La., U.S.A.

GLASS HONEY CONTAINERS

Pack your honey in these beautiful "Sunburst" containers for MORE SALES AND MORE PROFIT.
Complete with white coated tin plate caps with liners.
PROMPT SHIPMENT

PRICES:

No. Per Case	Size Jars	Ship Wt.	Price
24	8 oz.	10 lbs.	.90
24	16 oz.	16 lbs.	1.20
12	32 oz.	14 lbs.	.80
6	5 lb.	10 lbs.	.60

Special 5% discount on orders of $50 and 10% on orders of $100. Terms, net cash, f.o.b., Higginsville.
LEAHY MANUFACTURING CO.
HIGGINSVILLE, MISSOURI

Every Beekeeper knows:
No colony is better than its queen.
The disappointment of a poor honey crop may often times be the tragic result of inferior queens.
When you place your order with us, you can be assured of top quality Italian queens at fair prices.
We emphasize prompt, courteous and competent service.
1 to 49 ..... 65c each. 50-up ..... 60c. Postpaid.
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The Package Season is about over for this year. We have lots of Good Queens ready for immediate delivery.
ITALIANS CAUCASIANS
ITALIAN HYBRIDS
PRICES

1-24	$ .75	100-499	$ .65
25-99	$ .70	Tested Queens	$1.50 each

Postpaid, Airmailed, and/or Clipped—No Extra Cost
The Stover Apiaries **Mayhew, Miss.**

Select Italians
QUEENS
Package Bees
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BEES and QUEENS
Send for FREE Circulars
Booking orders now.
Over 30 years a shipper.
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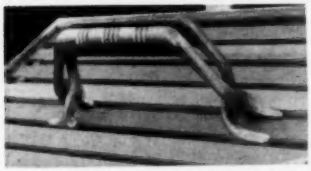

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Untested queens @ 55c each
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	1-24	25 or more
2-lb. pkg. w. q.	$3.75	$3.50
3-lb. pkg. w. q.	4.65	4.40
	1-10	11-24
Extra queens 1.20	1.10	1.00

10% books the order. Balance 15 days before shipping date.
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ITALIAN
PACKAGE BEES and QUEENS
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Rio Oso, California

Answers . . .

conducted by

Frank E. McLaughlin

What type of bees should I use primarily for pollination of legume crops on the farm which I operate? How near the field should the bees be located?

C. K. Clickener, Illinois

There is no special race or type of bee to be used primarily for pollination. However, there is a vast difference in bees and one thing is sure—it takes a good strong colony of bees to do the job, with as large a proportion of young brood as possible, eagerly consuming pollen as a protein food. This demand of the brood for protein keeps the bees hustling for pollen. When a honey-flow demands the attention of field bees, the amount of young brood to feed grows less and less and you will find that the bees are concentrating mainly on obtaining nectar from the field and not pollen.

The bees should be right in the field if possible. If you keep them over to the side, along a fence or in a reserved place through the middle of the field, the results will surprise you. We are inclined to use the fence lines with the bees at either side of the field facing into the field. You should have at least one colony per acre.

Please define the words "nuclei" and "nectar."

J. W. Smith, Missouri

The singular of the word nuclei is nucleus. It is a word that adheres closely to the singular and plural forms of Latin. A nucleus is any small hive which is not the same as the hive used for a full colony. In other words, two combs in a specially constructed hive of a size to hold two combs would be a nucleus. A larger one for three, four, five or more combs, as long as it is not a full hive size would still be called a nucleus. Also, some operators use half length nuclei with special combs. So we refer to the nucleus as a single unit or nuclei as several small units.

The word nectar applies to the sweet exudation of flowers gathered by honey bees. It is much like the sap of the maple trees which, when it is gathered from the tree, is thin and not particularly sweet, and the water content is high. Nectar from the flowers is later handled by the bees and the water evaporated until the concentration of sugar reaches the desirable proportion for sealing in the cells as honey.

Would it be practical or possible to partition a hive body with five frames on each side and put a queen in each side with a queen excluder on top? I would like to do this in order to have an extra queen on hand when needed.

E. T. Smith, Massachusetts

This system does not usually work. One or the other of the queens always comes up missing. It may not be impossible, but we have never seen it work. You will find you can keep only one queen living in the two compartments. Five frames are not enough room for a queen for very long, she will become crowded and need more room to lay.

You might try the two-queen system. A double queen excluder or a queen excluder and a screen wire frame, are put above a double hive body of bees with queen. Another hive of bees with queen is placed on top with an entrance to the back of the hive. Some beekeepers use the two-queen system by placing an inner cover between the two hives with the hole in the inner cover plugged. When needed, supers are added to both the top and bottom.

CAUCASIAN
Queens $75 per hundred.
D. T. WINSLETT
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Treat Your Hives With
CUPRINOL
STOPS ROT
Applied by brush, spray or dip to the bare wood. Cuprinol will greatly lengthen the life of your hives by stopping rot. May be painted over. Does not offend bees. At hardware, paint and lumber dealers or direct. $4.70 gal.; $1.75 qt. Check or money order. No C.O.D.'s
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QUEENS QUEENS QUEENS
Airmailed — 50c each.
Quality and Quantity unlimited.
Satisfaction assured, live delivery guaranteed.
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QUALITY LIGHT ITALIAN QUEENS
65c each
We appreciate your trade. That's why we are so sure you must like our queens and service.
B. A. ANDERSON & CO.
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GOOD QUEENS
Italian or Caucasian
Customer, if you want queens that will pay off in the future and produce bees that a man can handle with pleasure, send your requirements to me for I have them.
75c each.
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The choice of many experiment stations, commercial and small operators. The result of 43 years of beekeeping behind our stock. Why not have a specialist produce them for you instead of someone with little experience?
Prices: 1-24 ..... 80c 25 up ..... 75c postpaid.
BESSONET BEE COMPANY Donaldsonville, La.

JENSEN Says,—
Look to your queens as the dominant influence in the performance of your colonies. The fact a queen is young when introduced into a colony is no assurance that she has all the good qualities to be desired. Stock with background, that has stood the test through many years, having the primary characteristics of good bees consistently, year in and year out, should exact your consideration. We have specialized in rearing good queens commercially since 1915. Our customers' claims of superior performance are our inspiration.
"Magnolia State" Queens Clipped and Marked Free if so ordered. All Dadant's Starline Hybrid queens Clipped and Marked.
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"Magnolia State" Pure Italians
Prices—Balance of season
1-24 ... $0.95 25-99 .... .90
100-999 ... .85 1000 up ... .80
"Dadant's Starline" Hybrid Queens
JENSEN REARED for discriminating buyers who know and appreciate honest value.
Add 25c to prices at left.
JENSEN'S APIARIES, MACON, MISS., U.S.A.
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SELL MORE HONEY . . .
with this "DRIPCUT" disposable cap.
Your package will take on a "new look" and perk up in sales with this new, convenient, genuine "dripcut" closure. It stops messy drippings and waste! AND, you'll be surprised at how little it costs to add this PLUS sales feature that will make customers select your brand off the shelves.
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Please send samples of "dripcut" disposable cap and prices ..... lots. (Size: ..... mm.)
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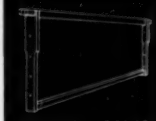
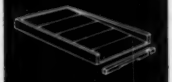
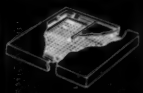
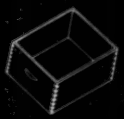
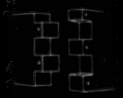

NAILLESS TOPBAR FRAME


"LEV-L-DRAIN" BOTTOM BOARD


THE "I-V" COVER


ROT-PROOFED HIVES

"V" SHASPED FRAME REST


BORED DOVETAIL

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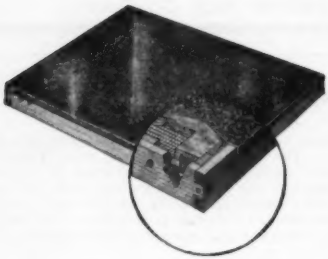

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Sold out for the season.
Thanks a lot.
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When thinking of your needs in package bees and queens, think of Newton Bee Co.

Our 25 years' experience in package bee shipping and queen rearing enables us to give you the best in quality and service.

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Regular stock or Dadant's Starline Hybrids at your request.

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Caucasian Queens at the following prices:

1 -24	$1.10
25-49	1.00
50-up	.90

No package bees.
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HONEY WANTED
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CAUCASIANS UNLIMITED

Summer prices of queens effective June 1 for balance of the season:

1 to 11	$1.00 each	50 to 99	$ .80 each
12 to 49	.90 each	100 or more	.75 each

Prices are by Air Mail postpaid. Queens are marked.

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low prices—save up to 28%. Free valuable premiums on orders.
We work your beeswax and purchase all grades of honey. Write today and save BIG money.
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Package Bees and Queens
For Quality and Service
KOEHNEN'S APIARIES
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1 to 50, 90c each: 50 or more, 80c
We Guarantee safe delivery Satisfaction. Orders filled promptly.
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DADANT'S STARLINE HYBRID QUEENS
Production and Resistance Combined
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Starline Queens	$1.30	$1.20	$1.10
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Dadant's Starlines — the production minded bee, with A.F.B. disease resistance built into them. Easy to work with. They recommend themselves.

Sunkist light-colored Italians — a favorite for years. High producers and gentle.

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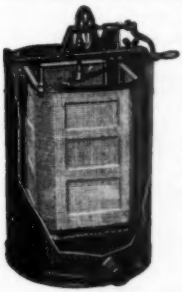
2-lb. pkg. w/q, $2.60; 3-lb. w/q, $3.50. Packages with Starline queens add 40c each.
Queens clipped, airmailed and painted on request.

SUNKIST BEE COMPANY Convent, La.



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Handles 12 standard, shallow or half-depth frames. Heavy gauge galvanized, formed angle reel. Completes extraction in 5 to 8 minutes. Easily loaded and unloaded. Easily cleaned. Adjustable flow honey gate. Weight 125 lbs. $76.50 FOB factory.

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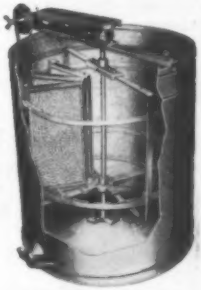

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At left 10-frame hive — At right MD hive
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Try the Modified Dadant Hive

The ideal hive for honey or for pollination

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Send for descriptive phamphlet—"The Modified Dadant Hive More Honey at Less Cost."

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All Around The Bee Yard

by G. H. Cale

At this time the honeyflow from white Dutch clover is better locally than it has been for ten years and the amount of both yellow and white sweet clover is more than it has been for several years. With enough moisture to allow plant growth and bloom to continue and with temperature levels pitched right, the amount of crop should be satisfactory and the honey of good body and quality.

Just note the factors in the above statement that must be in keeping one with another for results. Take the weather the past ten days just as Dutch clover was beginning to show white. The days when the top reading was less than ninety were few and the nights were hot too. However, the rainfall was above normal. The flow was good. Now it is cool at night and seventy-five to eighty-five by day. Still the flow is good. If and when the Dutch cuts out, sweet clover may continue for some time, even with less moisture and hot weather.

However, weather alone does not account for a honeyflow. Once we had bees right in sweet clover fields, with clover head high. The total yield was about a super to the colony, barely enough to pay for moving into the location.

Here, near town, there is a distinct difference between yields on definite soil types. North of town the yield is good, but we find low yields on less suitable soils south of town and this difference is noticeable each year, regardless of other factors. Sometimes it is difficult to locate the sources in these north yards, look around as you will.

So what it is that accounts for a honeyflow we do not know with any certainty. We labor with determination to have bees ready for a flow each year and we cannot determine at all that the flow will come even when we feel sure that the conditions are right for it. There is likely no more uncertain agricultural occupation than honey production.

At first glance, the new price support, with its higher levels, seems like what we need. However, if there is a crop, country over, con-

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siderably above normal, it may be that buyers will not offer to purchase honey at the support level; or the prices offered, even for the best honey, may not be more than this level.

It must be kept in mind though, that either under farm storage loans or purchase agreement, there are expenses and conditions involved that may make it more desirable to sell at a reasonable price than to delay sale, hoping for high prices. It is best to have all surplus honey move on to the market through normal trade channels because, in the long run, our job should be not only production but also the organizing of our marketing to take honey out of the peddling class and make its distribution and sale as decently controlled as any good food product.

When moving bees a distance we never have liked to dispense with screens and move at night, particularly when we don't know the exact spot to be used, or the condition of the ground (brush, high grass, litter and so on). We prefer to put on top screens and use wire push-in entrance screens, the latter inserted in the evening.

Some bees will ride outside, find a hole, or crack and push out enough to cluster in small groups contentedly until the truck is at location and unloading stops. Here a little smoke keeps these clusters from breaking up and going on the war path. We never have much trouble moving with this arrangement. The closing is done in the evening and, since we use top entrance holes, we don't wait for the bees to quit flying but, when flight is reasonably reduced, we slip in the entrance screens, leaving the top entrances open. When this is finished, we then close the top holes with tissue paper as the bees will then have ceased flight. In the early morning, several of us load up and move by day to the new place, getting there before the temperature is too high.

Often, enough bees are loaded for two new spots. Part are set off in one and the top entrances opened; then the balance are moved to the second spot, unloaded, unscreened and supered. A short trip back to the first is then made to finish up the colonies there. There is little drift or disturbance.

Almost always the colonies are moved with one super on so any honey available before the move is stored in the super; in the new place additional supers are given at once and there is little honey lost, even if moving is not done promptly before or at the start of a honeyflow.

You might get the impression that we move about constantly. We don't, but there are years when we do have to move a large number of colonies and most years there are some to be moved. This year the volume of moving has been heavy. About ten yards were relocated.

It is more preferable, however, to have permanent and well-chosen locations than it is to shift around frequently. And it is so much less time-consuming to service yards in the build-up when they are right where they will remain.

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Florida's New Pesticide Handbook . . .

The State of Florida has issued a remarkable publication entitled "Handbook on Pesticides and Their Uses in Florida Agriculture." While it is of greatest benefit to those engaged in agricultural pursuits, it also is beneficial to Florida beekeepers. In the general statement preceding the technical data and recommendations, a nice paragraph warns users of insecticides that they should keep in mind the possible effects of the material used on honey bees and other beneficial insects, mentioning that cucumbers, watermelons and a few other crops are entirely dependent upon these insects for pollination.

The Handbook was compiled by the Florida Agricultural Experiment Station, Agricultural Extension Service, Industry Organics Committee and the U. S. Fish and Wild Life Service. In its 131 pages, there is an index of pesticide materials, technical data about each, and a long and thorough list of crops, their pests and recommendations concerning control of injurious insects.

We do not know how many states have a similar publication; we do know of a few states who have called together those sending out recommendations for the purpose of issuing uniform and sound information. The continuous introduction of many new pesticides has created a complex situation. We congratulate Florida on this excellent publication and urge that other states do likewise. Certainly beekeeping would be helped and all agriculture would be benefited.

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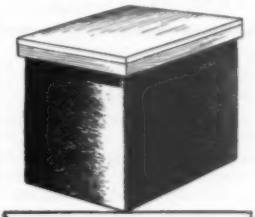

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T. Edwards—"Beekeeping for All," Cloth, 200 p.	1.00
R. O. B. Manley—"Beekeeping in Britain," Cloth, 410 p.	3.00
R. O. B. Manley—"Honey Production in the British Isles," Cloth, 325 p.	3.00
G. Ordetx—"Flora Apicola de la America Tropical," Cloth, 335 p., Illus.	6.00
Stewart—"Beekeeping Practice," Cloth, 200 p.	1.00
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AMERICAN BEE JOURNAL **Hamilton, Ill.**

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Growing Red Clover For Seed . . .

This is the title of a 9-page mimeographed publication recently issued by the research personnel of the Departments of Agronomy, Agricultural Engineering, Botany and Plant Pathology, and Entomology, of Purdue University, Lafayette, Indiana. The authors are listed as R. T. Everly, K. L. Athow, D. E. Burrough, G. H. Cutler, B. E. Montgomery, R. R. Mulvey, and K. T. Payne.

The publication briefly discusses adaptation, soil tests, fertility requirements, red clover varieties, seeding rates and methods, companion crops, clover diseases, injurious insects and their control, cutting the hay crop, pollination practices, combine adjustments and harvesting, and seed certification.

Under pollination practices, the Pollination Committee of the Indiana State Beekeepers' Association —composed of beekeepers, seed growers, and research workers— recommends two colonies per acre placed in the fields when the clover is not more than 10 per cent in bloom, and placed in groups—a minimum of four groups to each field or a maximum of 10 colonies per group. It also is recommended that a contract should be made between the grower and the beekeeper before the bees are placed in the field, and that growers interested in producing seed make their arrangements in early June.

Oregon Standards for Pollination Colonies . . .

The Department of Agriculture of the State of Oregon by Administrative Order No. AD-424 has established the regulations governing the strength of colonies for rental in pollination work.

Roughly, such colonies may be of two grades, the standard or A. grade field colony with at least 3,000 square inches of comb and 1,000 square inches of live brood and with all combs amply covered by bees, and a Grade B. or Oregon B. grade colony which must have not less than 75 per cent the brood strength of the standard colony.

Other requirements include freedom from disease, sufficient honey to carry them (10 pounds) and a normal laying queen.

Some tolerances are allowed. These standards became effective July 20, 1951.

New Ohio Apiary Law . . .

An act, passed by the last General Assembly, added six new sections to the Ohio Apiary Inspection Law and amended three existing sections thereof. The purpose of this act is to make possible more complete and efficient inspection of the bees in the state and thus further the control and eradication of bee diseases.

Registration of All Apiaries

One new provision makes it mandatory that any person owning or possessing bees in Ohio shall, on or before the first day of June of each year, file with the director of agriculture an application for registration, setting forth the exact location of his apiary or apiaries, and shall pay to the state department of agriculture, at the time of making application, a registration fee in the sum of one dollar for each apiary owned or possessed by him. Certificates of registration will be issued to all applicants.

Registration application forms and a complete text of the revised law will be mailed during the forepart of April to all beekeepers for which the state department of agriculture has correct addresses on inspection records of recent date.

Any Ohio beekeeper who has not received a registration application form and a copy of the law by April 15th can obtain the same on request by mailing a postal card to the Ohio Department of Agriculture, Division of Plant Industry, State Office Building, Columbus 15, Ohio. Compliance with the registration requirement of the law is the responsibility of each beekeeper.

Sales Permits

Another new provision specifies that no person shall sell, offer for sale, or transfer the ownership of any bee colonies or used beekeeping appliance without a permit. Such permits will be issued by inspectors once it has been determined that the colonies and equipment to be offered for sale are apparently free of disease.

A permit must also be obtained from the state department of agriculture before bees on combs or used beekeeping appliances can be shipped or moved into Ohio from any other state or foreign country.

Information obtained through registration will be a great aid to the inspectors in locating bees. The monies derived from the registration fees will be used to broaden the inspection program throughout the state and will enable the state to give more assistance to county inspectors. The task of administering the law and of supervising all inspection work is the responsibility of the state department of agriculture.

Anyone desiring more information on the Ohio law is urged to write to the Ohio Department of Agriculture for a complete text of the law.

S. E. Bailey, Specialist
In charge of Apiculture
Division of Plant Industry
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Everyone likes to see how a thing is made. You can sell more of any product if you arouse and satisfy the curiosity of your customers.

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The University of Massachusetts Extension Service recently published Special Circular No. 191, "Observation Beehives, Construction — Use." It was written by Frank R. Shaw of the Entomology Department. This little circular gives clear directions for building a 1½ frame observation hive yourself. Large, easy-to-follow construction drawings are included.

Points to remember as discussed in the circular, are that the location of the observation hive should not be too hot, should be well lighted and not subject to vibration, and that the flight entrance should be above the heads of passers-by.

We can help the national program for the promotion of honey this year by following up all these tips on good honey selling. If you have a roadside stand or an exhibit at the fair this year, include an observation hive and watch people crowd around.

This circular can be obtained from the Extension Service, University of Massachusetts, Amherst, Mass.

"Without doubt the ancient straw skep owed some of its popularity to its porosity which gave ideal winter ventilation until it became so plastered with wax and propolis that the bees died for want of it. Langstroth included an upper entrance in his first hive nearly a century ago." C. L. N. Pearson in "Bee Craft."

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Box 210 Paducah, Kentucky

Legume Seed Crops . . .

According to the December 1951 crop report of the U. S. Department of Agriculture nearly two-fifths of the entire hay crop of the United States is now alfalfa; nearly 43 million tons from 19 million acres. One-eighth of the crop is still wild hay with clover timothy about three-eighths.

ALFALFA: Over two million bushels of seed in 1951, 5% less than in 1950, but 50% more than the ten year average. Per bushel crop was 2.31 as compared to 2.36 in 1950 and a ten year average of 1.53 bushels.

RED CLOVER: 1,800,000 bushels in 1951 or 36% below 1950 crop. Largest yields were in the East; greatest reductions in the central West. The average per acre was 1.1 bushels as compared to a ten year average of .93 bushels. The acreage was far less in 1950.

ALSIKE CLOVER: 309,000 bushels in 1951, two per cent less than 1950 and 8% under the ten year average. Increases were heavy in California and Oregon. Per acre average of seed was 3.31 bushels as against the ten year average of 2.55 bushels.

SWEET CLOVER: 903,000 bushels or 59% of the 1950 crop. Seed average was 3.31 bushels as against a 10 year average of 2.55 bushels. Here, again, there were heavy reductions in acreages.

LESPEDEZA: Shortest crop in eleven years.

VETCH, MUSTARD, LUPINE:

Government figures show 239,000 acres of hairy vetch were harvested in the U. S. in 1951 for 46 thousand pounds of seed. Acreage 10 per cent less than 1950 and seed 15 per cent less.

Mustard seed production showed a little increase. But there was not over one-fourth as much acreage of lupine in 1951 as 1950, the total dropping to 26 thousand pounds of seed.

Other vetches are in small acreages, less than the year previous.

The tendency seems to be back towards the legumes after the large acreages planted in cotton in 1950, in many instances with very poor results.

Book on Bee Venom . . .

Dr. Jean-Pierre Bonimond, of the Bordeaux (France) Faculty of Medicine, is the author of a book entitled, "Le Venin d'Abelles," 80 pages, paper.

The major part of the book is taken up with a description of the analysis of the venom, how composed, and particularly its effect on the human body. He considers the venom of bees to be highly justifiable as a therapeutic in the treatment of various types of rheumatism. Recent work indicates the presence of toxin, enzymes, and "factors of diffusion" in venom.

Such toxin used in inoculating a human being gives variable results according to the dosage, the point of injection, and particularly the reaction of the individual. While the usual reaction is a gradual immunity with consecutive doses, in some individuals there exists an allergy which may accentuate the swelling and pain and even the danger with each additional inoculation.

The doctor gives no courses of treatment, and from his statements it is assumed that such treatments, at least at first, should be within reach of a physician on account of the occasional case where violent reaction might ensue.

The book is in French, sells for $1.00, and copies may be obtained from Editions Biere, Bordeaux, France.

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Don't Forget

When you are packaging this year's crop be sure that the containers and label are attractive. To assure yourself of a ready market, consult our Catalogs of Containers and True Character Labels. If you do not have them, ask for your copy now.

•

American Bee Journal

HAMILTON, ILLINOIS

Crop and Market

by M. G. Dadant

Crop So Far

Actually it is too early in most sections of the country to report on the crop. Apparently in the Southeast, Georgia's crop is less than last year and Florida probably will equal last year's crop. Through Alabama and Mississippi the crop is average or less, while Arkansas reports better than last year due largely to the heavy plantings of vetch. Texas was a disappointment although perhaps the total crop will equal 1951, which was not a bumper one by any means. In New Mexico reports are of very light crop and Arizona somewhat better. It is in California, however, that we report far better conditions than during the past twenty years. The rainfall amounting to some twenty-five inches compared to a normal of less than fifteen has flowered the desert places to the point where crowds have gone just to see the bloom. Orange crop has been at least average and the prospects for sage and other desert crops are far in advance of previously.

There has been some complaint of cool weather in northern California cutting off a little on the early crops.

In other sections of the country the crop has barely started at the time this is being written on June 20, although some sections have reported good flows from white Dutch clover and yellow sweet clover, somewhat curtailed by extremely hot, dry weather and a cool spell following. These conditions exist over practically all of the northern half of the country.

Crop Prospects

Prospects remain about as usual on the south Atlantic coast with considerable possibility of a fair to good sourwood flow in the higher altitudes.

Florida and Georgia do not expect as much as usual from palmetto but Texas still anticipates a hubam flow which will be of good proportions unless weather conditions turn bad.

Throughout the entire central west and northern states the attitude is "fingers crossed." The white Dutch clover is practically everywhere and has been yielding up to this date. The dry weather apparently has been broken by rains around June 20 and if warm weather follows the prospects should be good for excellent crop from white Dutch followed by the white sweet clover. Those strip mine areas having heavy sweet clover acreages are reporting excellent conditions.

Farther west prospects look unusually good owing to ample rains and satisfactory snows for irrigation. The San Luis Valley which has been "in the doldrums" for a number of years apparently is coming through with very fine prospects in 1952.

The Canadian provinces except for some dry areas in the western provinces apparently look favorable, although in Ontario conditions apparently are not as good as they were a year ago when a fine crop was harvested.

On the west coast prospects were somewhat dampened by cool weather in the northern sections but apparently this has largely lifted. There is report of many bees being shifted over to pollination this year which may cut the crop some. However, increased number of colonies undoubtedly will counteract.

On the whole it looks like the 1952 crop would exceed that of 1951 which in itself was very satisfactory.

Crop Sold

There is a universal report that the 1951 crop and previous holdovers of honey have been completely disposed of. What little is left is in strong hands. Even the cooperatives report the carryover will be negligible when the new crop is ready for them and there are reports that old honey could be sold in some instances as high as 13 cents a pound to carry over for some packers.

In the Canadian provinces Ontario and Quebec still have a carryover from last year of some two million or more pounds of honey but it is held in close hands and there has been no tendency of a weakening in the market. There is no honey support plan in Canada. However, the Canadian Council efforts are having good effect and the fact that they have cleared up all but the two or three million pounds of honey from a former much heavier surplus indicates that conditions are going along satisfactorily.

Prices On New Crop

In most cases the new crop is not available, but everywhere where new crop has been offered for sale it has been at the advanced price which is indicated by the advance in ceilings in the 1952 price support program amounting to approximately 2 cents a pound.

In other cases old honey has advanced somewhat but there has been a tendency on the part of the smaller packer at least to clear out the old crop at the old price and meet the challenge of higher prices for the fall of 1952. Cooperatives are to some extent complaining that they do not fit into the picture of the honey support program inasmuch as there is no leeway for their handling honey in bulk for their members. So a recommendation is brought out in some instances for members, particularly on off-grade honeys, to make their dealings with the Production and Marketing Administration and endeavor to dispose of their honey in this fashion.

Naturally this counters the plans for holding honey and then feeding it gradually into the market so as to relieve the government of the burden. Fortunately, however, very extensive plans are coming along for publicity for honey through combination efforts of the PMA, the Federation and the American Honey Institute as well as, we hope, galvanized efforts on the part of individual beekeepers and smaller packers. It looks like there would be a bigger advertising effort in the fall of 1952 than there has ever been to publicize honey. We hope so, because undoubtedly the crop is going to be a big one and the possibilities for European sale do not seem to be any brighter, if as bright, as a year ago.

Honey Wanted— Cars and less than car. Top Prices.
C. W. Aeppler Co., Oconomowoc, Wis.

The Market Place . . .

BEES AND QUEENS

SHORT'S QUEENS ARE GOOD QUEENS. Try them and you will find their colonies tops in production, gentleness, and free from diseases. Three banded Italians only. Used by leading honey producers for more than 30 years. Requeen now for maximum production next year. $1.00 each; 10, $9.00; 25, $20.00. Prompt shipment. Postpaid. H. C. Short, Fitzpatrick, Ala.

YELLOW ITALIANS—Real honey producers, service guaranteed. 3 lbs. with queen $4.50. Queens 80c; 50 up, 75c. Air mail. O. E. Brown, Rt. 1, Asheboro, North Carolina.

BRIGHT 3-BAND ITALIAN queens 75c—Bright or dark. Luther Pickett, Owner Orange Bee Co., Efland, N. C.

CAUCASIAN QUEENS — Untested, laying, $1.00 each. Eppling's Apiaries, Covington, Virginia.

YANCEY HUSTLER QUEENS — Three-band Italians, bred for business. $1.00 each; $10.00 per dozen. All guaranteed. Caney Valley Apiaries, Bay City, Texas.

NORTHERN BRED ITALIAN queens $1.00 each. Diemer Bee Co., Rt. 2, Bx. 7, Liberty, Mo.

QUEENS — Reliable strain, $1.00 each. Dalice E. Crawford, Rt. 1, Haw River, N. C.

CAUCASIAN BEES AND QUEENS—Extra good workers and very gentle. 2-lb. with queen $3.00; 3 lb. with queen $4.00. Select untested queens, 1 to 25, $1.00; 25 to 100, 90c; 100 up, 80c each. All orders given special attention. Black River Apiaries, Elliott Curtis, Mgr., Currie, North Carolina.

THREE BANDED ITALIAN bees and queens, best of quality. 2-lb. with queen $3.00; 3 lb. with queen $4.00. Select untested queens, 1 to 25, $1.00; 25 to 100, 90c; 100 up, 80c. Write for prices on larger orders. Phone 4703. Alamance Bee Company, Geo. E. Curtis, Mgr., Graham, North Carolina.

GOLDEN ITALIAN BEES and QUEENS very yellow and gentle to work with. 2 lb. with queen $3.00; 3 lb. with queen, $4.00. Select untested queens, 1 to 25, $1.00; 25 to 100, 90c; 100 up, 80c. Satisfaction guaranteed. Phone 7731. Carolina Bee Farm, W. O. Curtis, Mgr., Graham, North Carolina.

CAUCASIAN QUEENS — Young, laying. Personally raised. $1.00 each. Fred Brock, McDonald, Tenn.

SELECTED ITALIAN QUEENS 75c each, Caucasian 90c, Carniolans $1.00 each. All queens shipped by Air Mail and guaranteed to please. Walter D. Leverette, P. O. Box 364, Ft. Pierce, Florida.

DOES EXPERIENCE and KNOW HOW mean anything to you? Green's profit producing queens are backed by 25 years of breeding better queens and shipping them to you when you want them. Price —90c each; after June first, 50c each. D. P. Green, Rt. No. 2, Deland, Fla., Telephone 512M.

CAUCASIAN QUEENS—One, 75c; twenty-five or more, 65c each. Tillery Brothers, Greenville, Ala.

FOR SALE

FOR SALE—60 stands of bees and will sell our property with a small honey house if wanted. Earl L. Fisher, Brighton, Iowa.

FOR SALE — 425 producing colonies of bees in Kansas. Will consider prompt sale with crop on. C. L. Auerbach, Iola, Kansas.

Copy for this department must reach us not later than the tenth of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

Rate of Classified advertising—13 cents for each word, letter, figure or initial, including the name and address. Minimum ad, ten words.

As a measure of precaution to our readers we require reference of all new advertisers. To save time, please send the name of your bank and other references with your copy.

Advertisers offering used equipment or bees on comb must guarantee them free from disease or certificate of inspection from authorized inspector. The conditions should be stated to insure that buyer is fully informed.

FOR SALE—50 colonies of bees, $9.00 per colony, including supers. Health certificate if desired. Discount on entire lot. Located in Missouri. Write Box XX, c/o American Bee Journal.

95 60-lb. cans, used once, 55c each. Robert Welters, First North, Melrose, Minn.

40 10-frame double hive colonies. All extracting equipment for 75. No disease. Write for particulars. Herbert Parker, Iuka, Ill.

19 colonies of bees, 38 M.D. hives, 116 M.D. shallow supers, 31 queen excluders, 4-frame extractor, 50-gal. honey tank. Floyd Kite, 505 E. Court St., Richland Center, Wis.

USED WOODMAN 30-frame extractor in good condition. Alvin Maxwell, Snover, Michigan.

500 3-story 10-frame colonies near Sacramento, Calif. Excellent opportunity for young man interested in early queens and packages. Good orchard and pollination fees. Excellent late fall honey locations. Box 17, c/o American Bee Journal.

FOR SALE—1952 models Electro-Flo filling machines $285.00 f.o.b. Hancock Honey House, Hancock, Iowa.

NINE HUNDRED POUNDS Dadant's crimp-wired foundation and several hundred new standard bodies with wired frames. Walter Roose, Sac City, Iowa.

HONEY and BEESWAX WANTED

CUT COMB, CHUNK, Clover preferred. Truck lots or less. Cash on delivery. Lose Brothers, Inc., 204-206 E. Jefferson, Louisville, Ky.

WANTED — Extracted honey, white or light amber, in 60's. State price in first letter. Ed. Heldt, 1004 W. Washington St., Bloomington, Illinois.

WRITE FOR SHIPPING TAGS and current quotations on rendered beeswax. Any amount from one pound up bought. If you have 25 pounds or more, save 25% by letting us work it into foundation for you. Walter T. Kelley Co., Paducah, Kentucky.

HONEY WANTED—All grades and varieties. Highest cash prices paid. Mail samples. State quantity. HAMILTON & COMPANY, 1360 Produce Street, Los Angeles, California.

WANTED—All grades comb and extracted honey, large or small amounts. Quote price in first letter. Mail sample. King Honey Co., 4308-10-12 E. Truman Road, Kansas City, Mo.

CARLOADS or less of honey and wax. Send sample and price. Alexander Co., 819 Reynolds, Toledo, Ohio.

COMB and EXTRACTED HONEY wanted. Truck or carload lots. Contact Victor Honey Farms, Josephine, Texas.

WANTED—Honey, amber or white. Mail samples and state quantity. No buckwheat. Holland Honey Cake Co., Holland, Mich.

WHITE GRADES 11.4 and cans back, delivered. Mail samples. Cole Honey Co., 4460 Piedmont Ave., Oakland, Calif.

WANTED—3 carloads of buckwheat honey, 2 carloads of Florida orange blossom honey in barrels or cans, 2 carloads of southwestern alfalfa or cotton honey. Cash and top prices. Alexander Company, 819 Reynolds Road, Toledo, Ohio.

WANTED—Extra white and light amber honey. Let us ship you the containers. Sell us your honey for CASH on delivery. The Hubbard Apiaries, Manufacturers of Bee Supplies and Comb Foundation, Onsted, Michigan.

HONEY FOR SALE

TRUCKLOADS clover honey in sixties. Walter Roose, Sac City, Iowa.

ANY GRADE — any amount. Alexander Company, 819 Reynolds, Toledo, Ohio.

CLOVER EXTRACTED HONEY in sixties. Ralph Gamber, 910 State, Lancaster, Pennsylvania.

HONEY, white clover, 17c per lb. 5 sixties or more 16c. Satisfaction guaranteed. Lose Brothers, 206 E. Jefferson, Louisville, Ky.

SUPPLIES

WRITE FOR CATALOGUE. Quality bee supplies at factory prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Manufacturers of Beekeepers' Supplies, Onsted, Michigan.

THE BIGGEST BEE SUPPLY CATALOGUE PUBLISHED (64 pages) free for the asking. Big factory manufacturing a complete line of wooden goods, comb foundation, metal goods, veils and gloves, carloads in stock, daily shipments, save 20%. WALTER T. KELLEY CO., PADUCAH, KENTUCKY.

THE ONLY COMB FOUNDATION PLANT in the East. We sell foundation, work your wax, render combs and cappings. Robinson's Wax Works, Rt. No. 3, Auburn, New York.

BEE SUPPLIES—Tin packages, 10 sizes glass jars, paper shipping supplies, window cartons and other items. Roscoe F. Wixson, Dundee, N. Y.

SOUTHERN CALIFORNIA HEADQUARTERS for Bee Supplies. Make our facilities your "Trading Post." Complete stocks. See our Bulletin Board for Budget Bargains. The Diamond Match Company, 1300 Produce St., Los Angeles 21, Calif.

FOR CHRYSLER all steel electric welded queen excluders in the U.S.A. write to: Prairie View Honey Co., 12303—12th St., Detroit 6, Michigan. Ask for circular E 2.

BEE SUPPLIES—Catalogue free. Hodgson Bee Supplies Ltd., 565 13th Ave., New Westminster, B.C., Canada.

POSITION AND HELP WANTED

APPLICATIONS WANTED for year around work in commercial beekeeping. Give experience, age, and salary details in first letter. York Bee Company, Jesup, Georgia.

SEEDS AND TREES

HONEY PLANTS our specialty. Catalogue on request. Pellett Gardens, Atlantic, Iowa.

HONEY LABELS
Improved designs, embodying color, balance, simplicity, and distinction. Please send for free samples & prices.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

NEISES
HONEY EXTRACTING
and
BOTTLING EQUIPMENT
Mf'd. and For Sale by
THE NEISES CO.
Box 249, Marshfield, Wis.

WANTED

12- 20- or 30-frame extractor, power drive. L. M. Berry, Okiee, Minn.

MISCELLANEOUS

KNOW interesting facts concerning the bees of India through the INDIAN BEE JOURNAL, published in English, by the Bhupen Apiaries (Himalayas), Ramgarh, Dist. Nainital, U.P., India, and obtainable from them. Subs. Rs. 7/-or 10 Shillings or $2.25 per annum. Single copy Rs. ¼-s. 1/9 or 40 cents (international money order). Payment in mint postage stamps of your country accepted.

"HONEY IN THE COMB," by Carl E. Killion. Let this book help you make a profit from your bees. Price postpaid $3.00. Killion & Sons Apiaries, Paris, Ill.

RANCH MAGAZINE—Do you find it difficult to secure information about sheep and sheep ranching methods? The SHEEP AND GOAT RAISER reaches more sheepmen with more information of range sheep than any magazine published. Subscription $1.00. Hotel Cactus, San Angelo, Texas.

Dadant's Foundation For Bulk Comb Honey

A special, light colored foundation, somewhat heavier than thin super, but lower in price. White, beautiful comb honey packed in glass and surrounded with a fine grade of liquid honey is a package that customers just want to buy.

DADANT & SONS, Inc.
HAMILTON, ILLINOIS

HONEY WANTED
Carloads and less than carloads. Mail sample and best prices in all grades.
C. W. AEPPLER COMPANY
Oconomowoc, Wisconsin

60-LB. CANS

Several Thousand Used Cans Just Like New

— Also —

Brand New Cans With Large Size Openings

Packed in Cartons of 24

— or —

in Bulk Truckloads

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Carloads

HONEY LABELS

HONEY JARS IN ALL SIZES
5 lb. Pails 10 lb. Pails

CORRUGATED SHIPPING CASES
Please write for prices.

C. W. AEPPLER COMPANY
Drawer 239
Oconomowoc, Wisconsin

Honey from Distinct Sources

(See Prof. Lovell, Page 121 March American Bee Journal)

I was very glad to see Prof. Lovell's opinion on selling honey by flavor not color. I have thought for a long time that beekeepers were making a mistake to put all the emphasis on color and none on source.

Years ago customers seemed to know their honey better than they do at the present time. They asked for honey by name—clover, basswood, buckwheat. Now they all say, "I like the light colored honey." Our "light colored" honey may come from various sources; each having a flavor all its own. Our clover honey varies in color from year to year. One year it was waterwhite like corn sirup. Lately it has been much darker, and the flavor is much better, but customers sometimes object to the color.

A class in nature study with their teacher comes to study bees in our yard; I put the different colored honeys in sample jars and ask the children which one they like best. Invariably they choose the lightest in color, although there sometimes is no difference between that and the next bottle in flavor. I see to that. Right here we have work to do. Would we buy sugar or molasses if we were uncertain of the flavor?

At present, I have no sample of honey from one known source.

Our family has had a beekeeper in it for many years and we always tried to keep our honey separated by sources if we could do so. I think it is the only fair way to grade honey; color may be seen but flavor is an unknown quantity to the purchaser under our present system of marketing. C. G. Jones, Wisconsin

House Apiary . . .

John Spiller of St. James Old Vicarage in Linden Grove, Taunton, England, kindly sends us a copy of his new book entitled, "The House Apiary," in which he gives the advantages of such arrangements.

He recommends a small house containing from four to ten colonies. He contends that much honey is lost through overstocking, which can well be true. The advantages claimed for the house apiary are that it maintains more even temperature winter and summer, cuts down robbing and allows working the bees in any weather. The book is available from the author for $1.75, is clothbound and has 60 pages.

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Meetings . . .

(Continued from Page 298)

Hancock Co. (Ohio) Meeting
July 20

The Hancock County Beekeepers Association is holding an all-day meeting at the queen yard of Mr. Glen Barger, 1½ miles west of Carey, Ohio, just off Route 15, on Sunday, July 20. Basket lunch.

We will have speakers in the afternoon. All beekeepers are invited to attend.

H. H. Smith

Purdue (Ind.) Summer "Ag" Conference

Tuesday, July 29

Beekeepers' Program

8:30-10:30 CST (9:30-11:30 DST)
Agricultural Building, Room 207

Truman E. Young, Boonville, president of Indiana State Beekeepers' Association, presiding.

Producing and Distributing Better Queen Bees, C. A. Reese, Extension Apiarist, Ohio State University.

The Important "Honey" Plants of Indiana, Howard R. Youse, Professor of Botany, DePauw University.

Honey Crop Conditions, Gilbert Perigo, Chief Apiary Inspector, Indianapolis.

Memorial Union, Room 230—Women's Division

Mrs. T. E. Young, president, "Hoosier Honeys," Boonville, presiding.

Demonstration — Use Honey for Fine Flavor, Ruth Jordan, Agricultural Experiment Station, Purdue.

Demonstration — Uncooked jams from frozen and fresh fruit, Mary Kramer, School of Home Economics, Purdue.

Panel Discussion—Promoting the Use of Honey in the Community—Representatives of county groups.

10:45-12.15 CST (11:45-1:15 DST)

Purdue Inter-mural Picnic Grounds —Basket Dinner for beekeepers, families and friends. (Bring your own picnic lunch or basket dinner.) Picnic grounds located just north of new Residence Hall.

12:30-3:30 CST (1:30-4:30 DST)
Purdue Agronomy Farm (about 5 miles northwest of Purdue on Road No. 52)

Gilbert Perigo, Indianapolis, presiding.

Tour of honey plant garden and clover pollination plots, B. E. Montgomery, Entomology, Purdue.

Report from pollination committee, R. T. Everly, Purdue.

Honey Bees and Clover Pollination in Ohio, C. A. Reese, Extension Apiarist, Ohio State University.

Demonstration — Handling Bees, Indiana Apiary Inspectors.

12:15-2:30 CST (1:15-3:30 DST)
Eliza Fowler Hall—Women's Division

Home Furnishings Fashion Show, Dorothy Benson.

Effects of Good and Poor Diets as Shown in Live Animals, Virginia A. White, School of Home Economics, Purdue.

"'Fertile Virgins.' There isn't such an animal. A virgin queen that fails to mate is almost invariably lost or becomes a drone breeder. Of course such a queen might produce some diploid eggs much the same way as it may be supposed that laying workers do, but such cases must be very rare if they, in fact, exist at all, but it is not impossible." R. O. B. Manley in "Bee Craft."

To Whom It May Concern:

Effective January 1, 1952, the partnership of

ROSSMAN & LONG

was dissolved with J. G. (Joe) Rossman buying the interest of E. W. (Emerson) Long of St. Paris, Ohio.

J. G. Rossman will continue to manage the Package and Queen business in Georgia.

There will be NO change in PERSONNEL or POLICY in dealing with the public.

Both Emerson and Joe feel this arrangement is better and terminate their very pleasant relations as partners with best wishes each for the other.

Queens available all fall. Regular or Kelleys Island 3-way Hybrid.

1 to 25 .... 85c each; 26 or more .... 75c each
No more packages this year, please.

"They Produce"

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Formerly Rossman & Long

P. O. Box 133 Moultrie, Ga.

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Midwest Distributor for

BOGENSCHUTZ
UNCAPPING MACHINE

HEADQUARTERS FOR

Electro-Flo Filling Machine Clarifiers
Extractors Capping Dryers
Storage Tanks

WRITE ON ANY OF YOUR BEE EQUIPMENT NEEDS

Sioux Honey Association

SUPPLY DEPARTMENT

Box 1107 Sioux City, Iowa

New

Protector Glove

Plastic treated hands

Smooth, light color; reduce propolizing; soft cotton inside; washable; withstand acid, boiling water; will not peel or harden.

Wrist ventilators

Cool and comfortable

Sting resistant

Gloves and gauntlets, both difficult for stings to penetrate

Elbow ties

Elastic pull cords make elbow ties easy and quick to adjust.

Price — $2.75 (large or small size)
Postage Extra

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Hamilton, Ill. Paris, Texas

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ANN ARBOR MICHIGAN
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And Now— a Good Carton Made Even Better

The Root Comb Honey Carton is made of snow-white sulphite board—a pure virgin pulp sheet that is white all the way through. The fact that it is odorless and tasteless makes it an ideal food container. You'll like its bright appearance!

Label Time is Here

Our 16-page catalog is full of many designs, styles, and colors to fit your label needs. It is free for the asking.

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